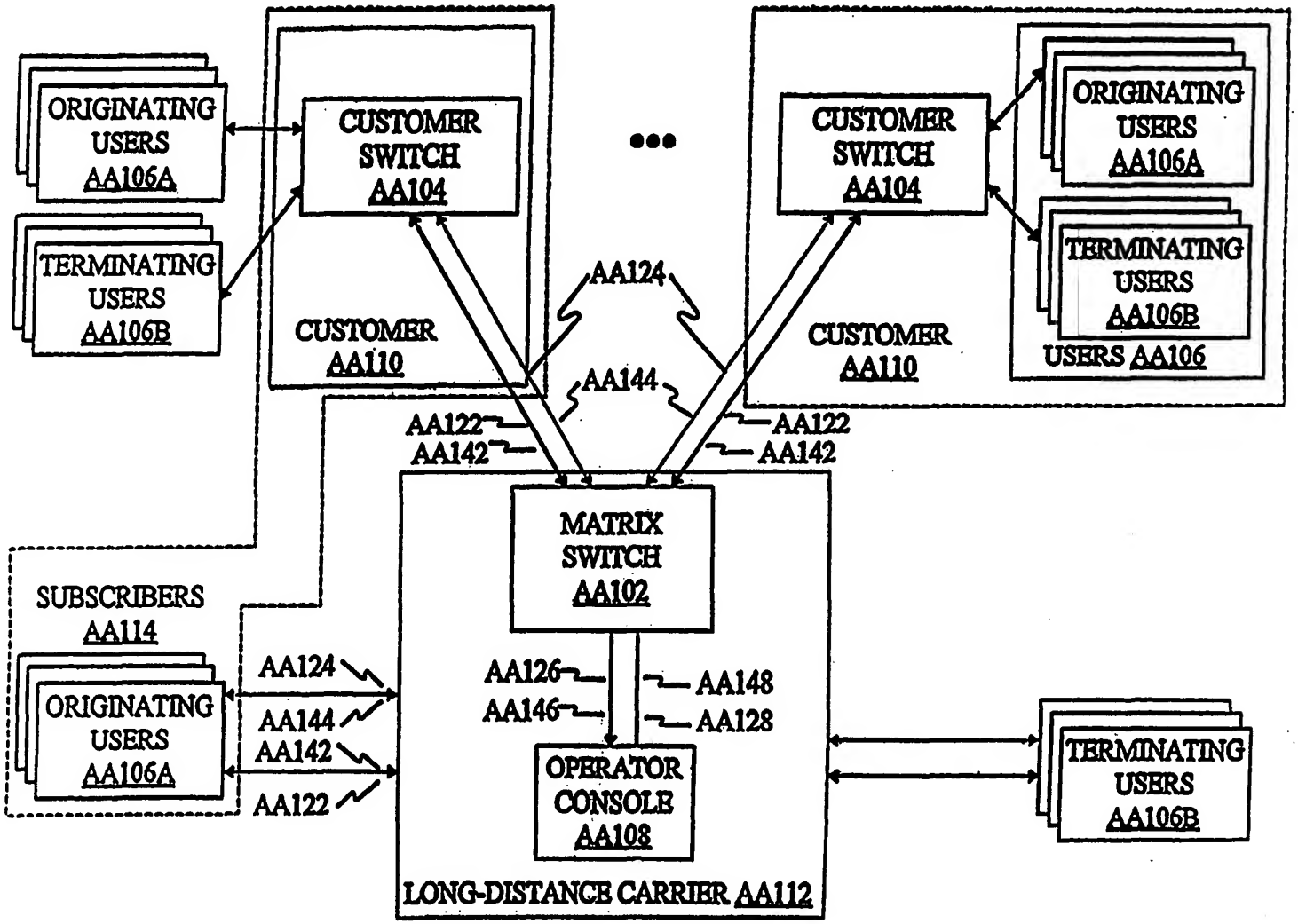

ORIGINATING USERS AA106A
TERMINATING USERS AA106B
CUSTOMER SWITCH AA104
CUSTOMER AA110
AA124
AA144
AA122
AA142
CUSTOMER SWITCH AA104
ORIGINATING USERS AA106A
TERMINATING USERS AA106B
USERS AA106
CUSTOMER AA110
MATRIX SWITCH AA102
SUBSCRIBERS AA114
ORIGINATING USERS AA106A
AA124
AA144
AA142
AA122
AA126
AA146
AA148
AA128
OPERATOR CONSOLE AA108
TERMINATING USERS AA106B
LONG-DISTANCE CARRIER AA112

FIG 1

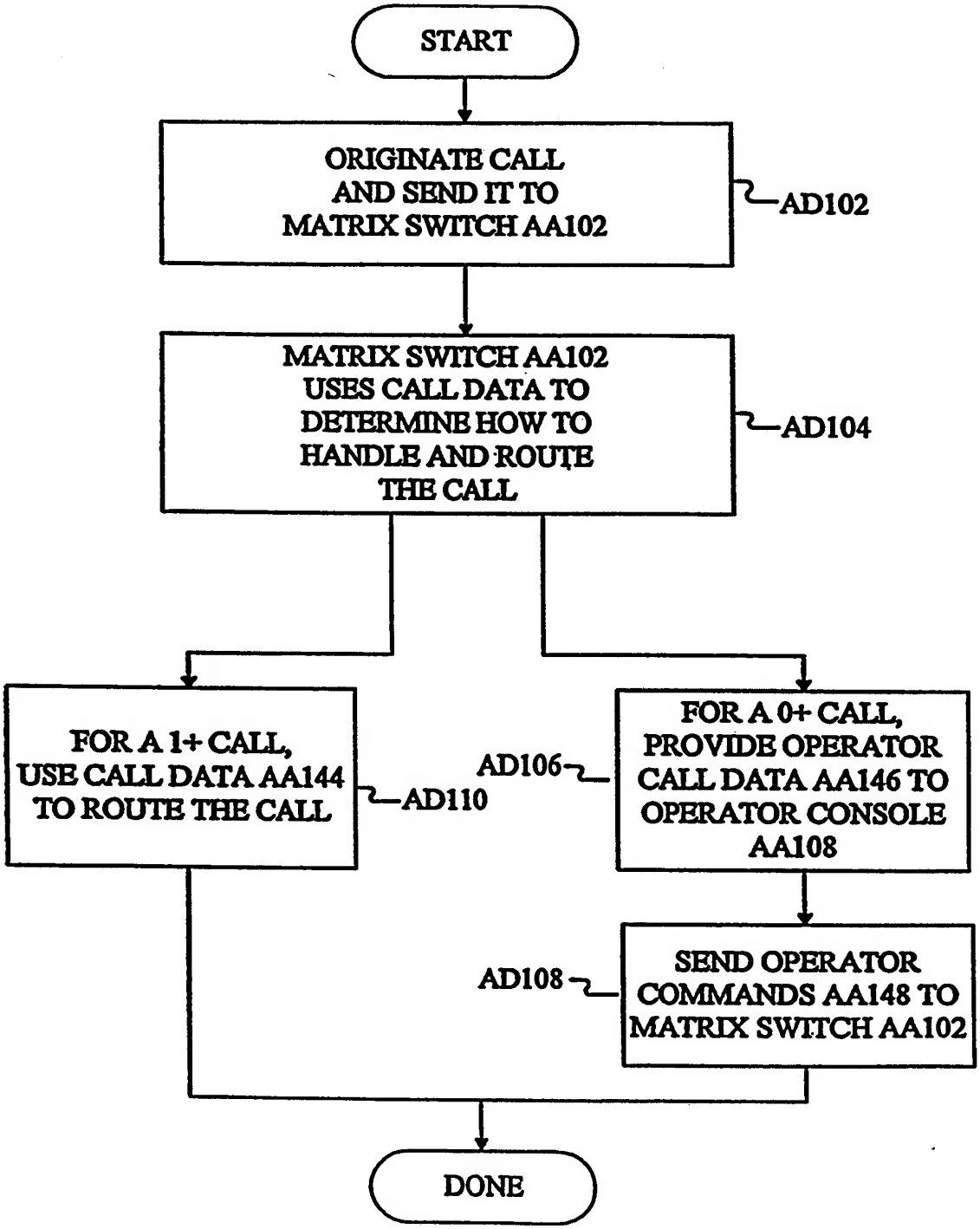

START
ORIGINATE CALL AND SEND IT TO MATRIX SWITCH AA102
AD102
MATRIX SWITCH AA102 USES CALL DATA TO DETERMINE HOW TO HANDLE AND ROUTE THE CALL
AD104
FOR A 1+ CALL, USE CALL DATA AA144 TO ROUTE THE CALL
AD110
AD106
FOR A 0+ CALL, PROVIDE OPERATOR CALL DATA AA146 TO OPERATOR CONSOLE AA108
AD108
SEND OPERATOR COMMANDS AA148 TO MATRIX SWITCH AA102
DONE

FIG 2

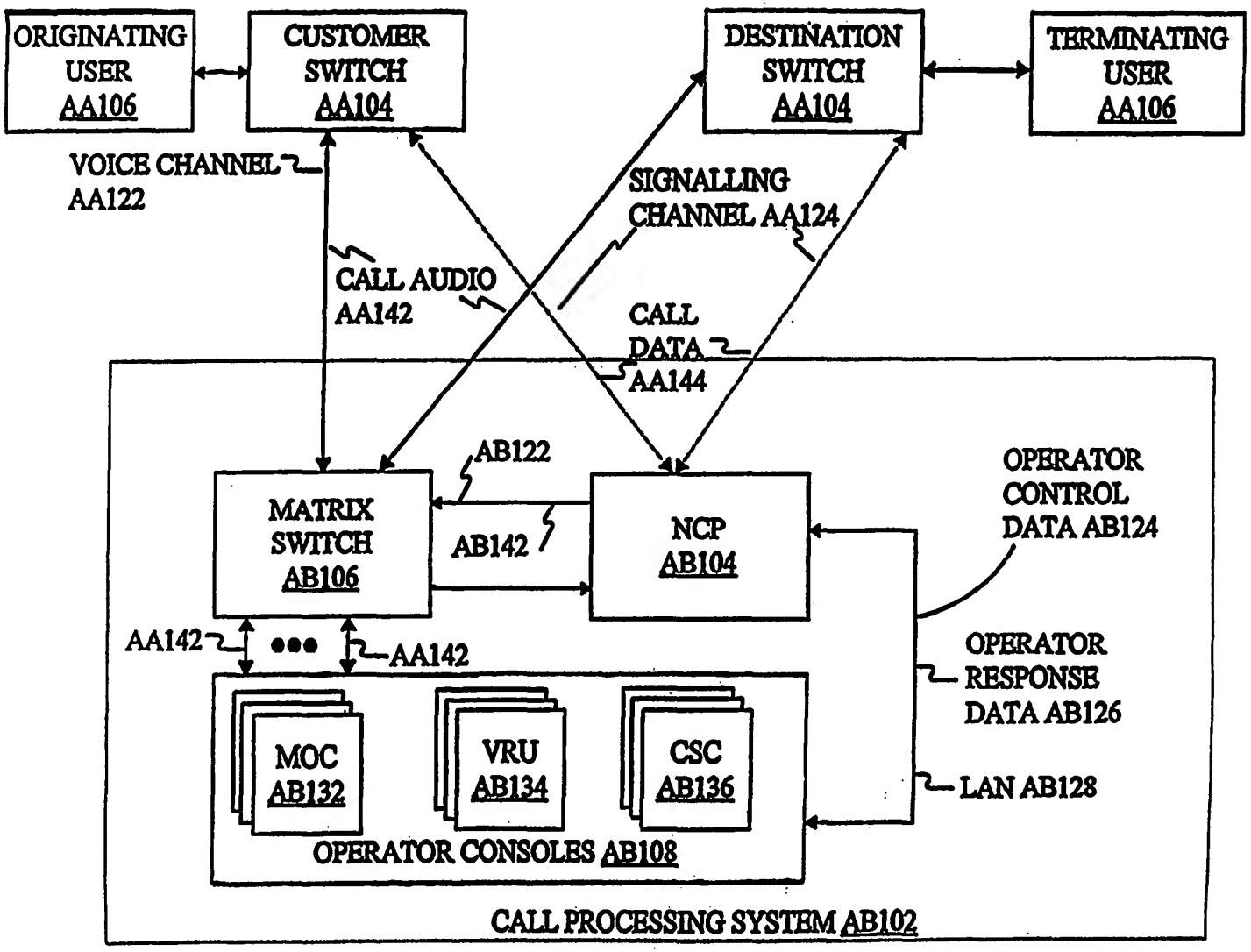

ORIGINATING USER AA106
CUSTOMER SWITCH AA104
DESTINATION SWITCH AA104
TERMINATING USER AA106
VOICE CHANNEL AA122
SIGNALLING CHANNEL AA124
CALL AUDIO AA142
CALL DATA AA144
AB122
MATRIX SWITCH AB106
AB142
NCP AB104
OPERATOR CONTROL DATA AB124
AA142
AA142
OPERATOR RESPONSE DATA AB126
MOC AB132
VRU AB134
CSC AB136
LAN AB128
OPERATOR CONSOLES AB108
CALL PROCESSING SYSTEM AB102

FIG 3

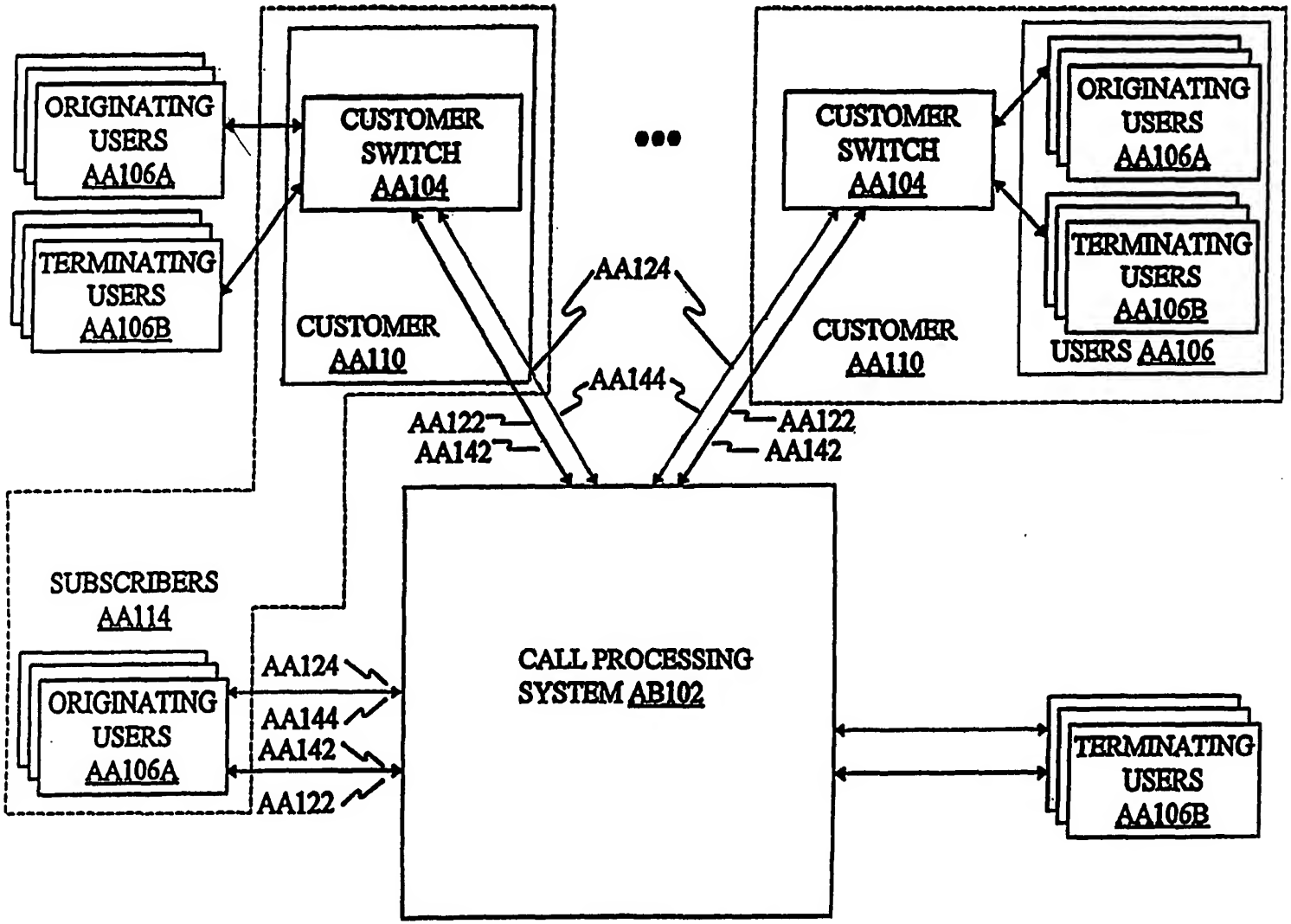

ORIGINATING USERS AA106A
TERMINATING USERS AA106B
CUSTOMER SWITCH AA104
CUSTOMER AA110
AA124
AA144
AA122
AA142
CUSTOMER SWITCH AA104
ORIGINATING USERS AA106A
TERMINATING USERS AA106B
USERS AA106
CUSTOMER AA110
SUBSCRIBERS AA114
ORIGINATING USERS AA106A
AA124
AA144
AA142
AA122
CALL PROCESSING SYSTEM AB102
TERMINATING USERS AA106B

FIG 4

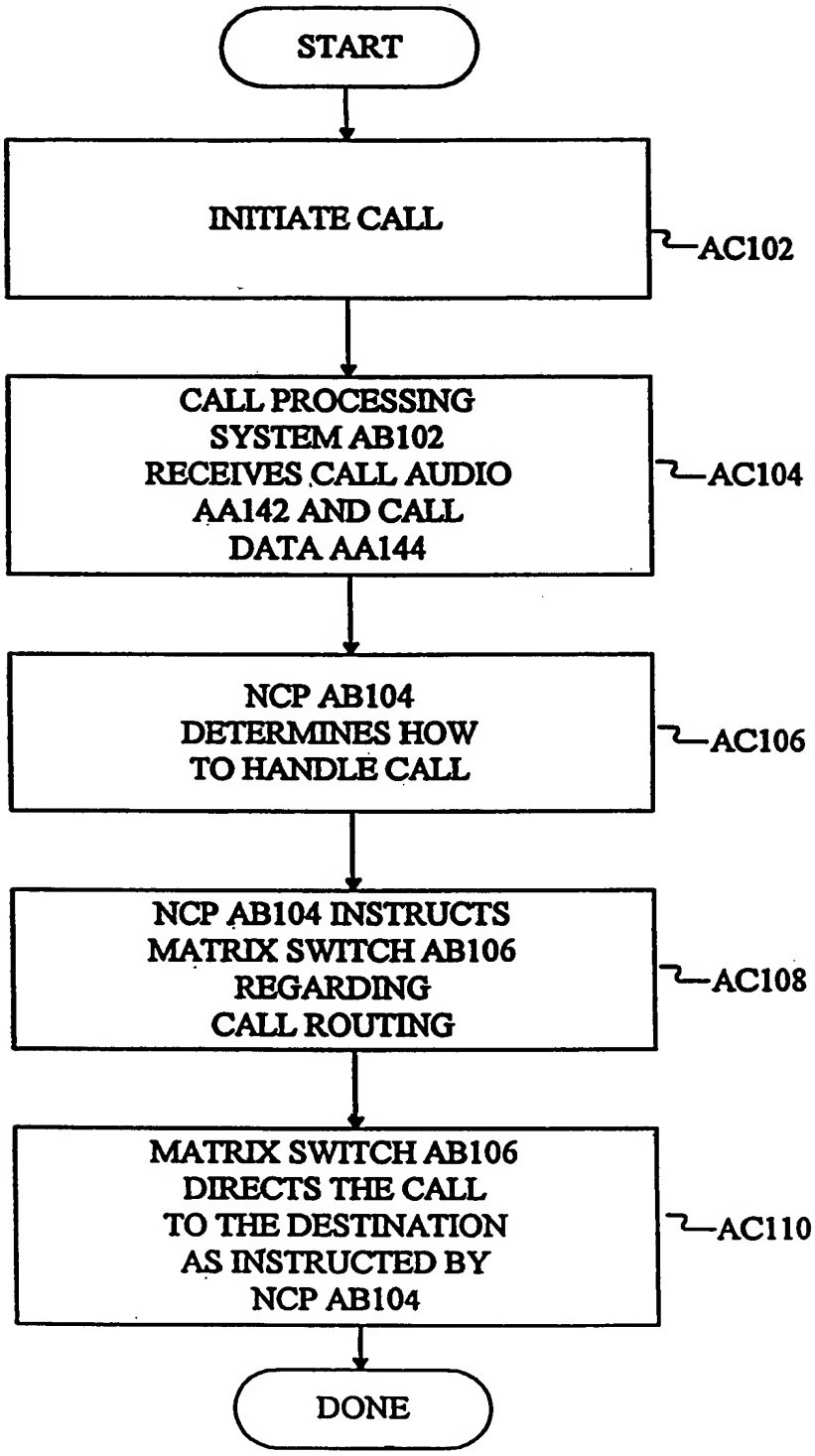

START
INITIATE CALL
AC102
CALL PROCESSING SYSTEM AB102 RECEIVES CALL AUDIO AA142 AND CALL DATA AA144
AC104
NCP AB104 DETERMINES HOW TO HANDLE CALL
AC106
NCP AB104 INSTRUCTS MATRIX SWITCH AB106 REGARDING CALL ROUTING
AC108
MATRIX SWITCH AB106 DIRECTS THE CALL TO THE DESTINATION AS INSTRUCTED BY NCP AB104
AC110
DONE

FIG 5

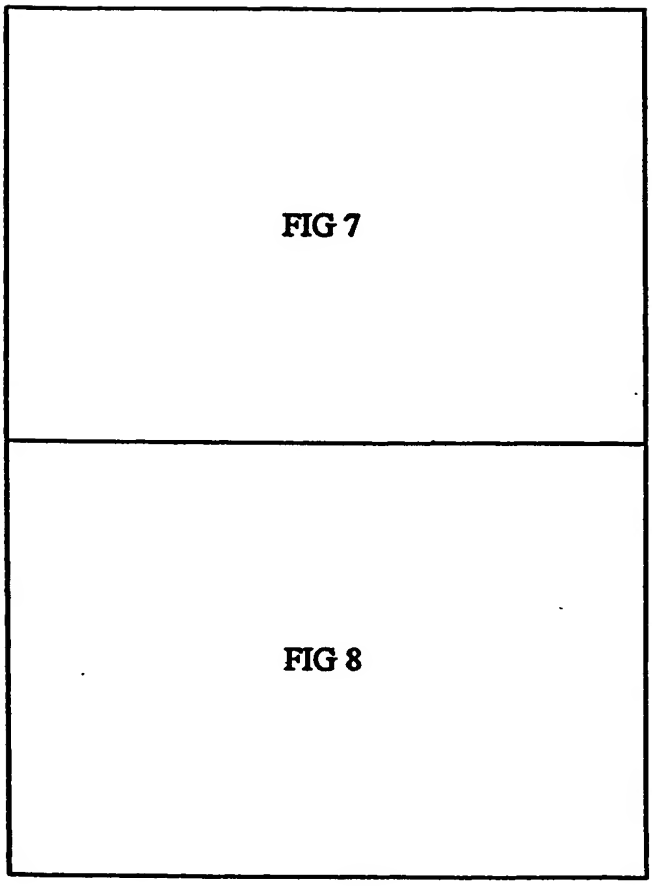


FIG 6

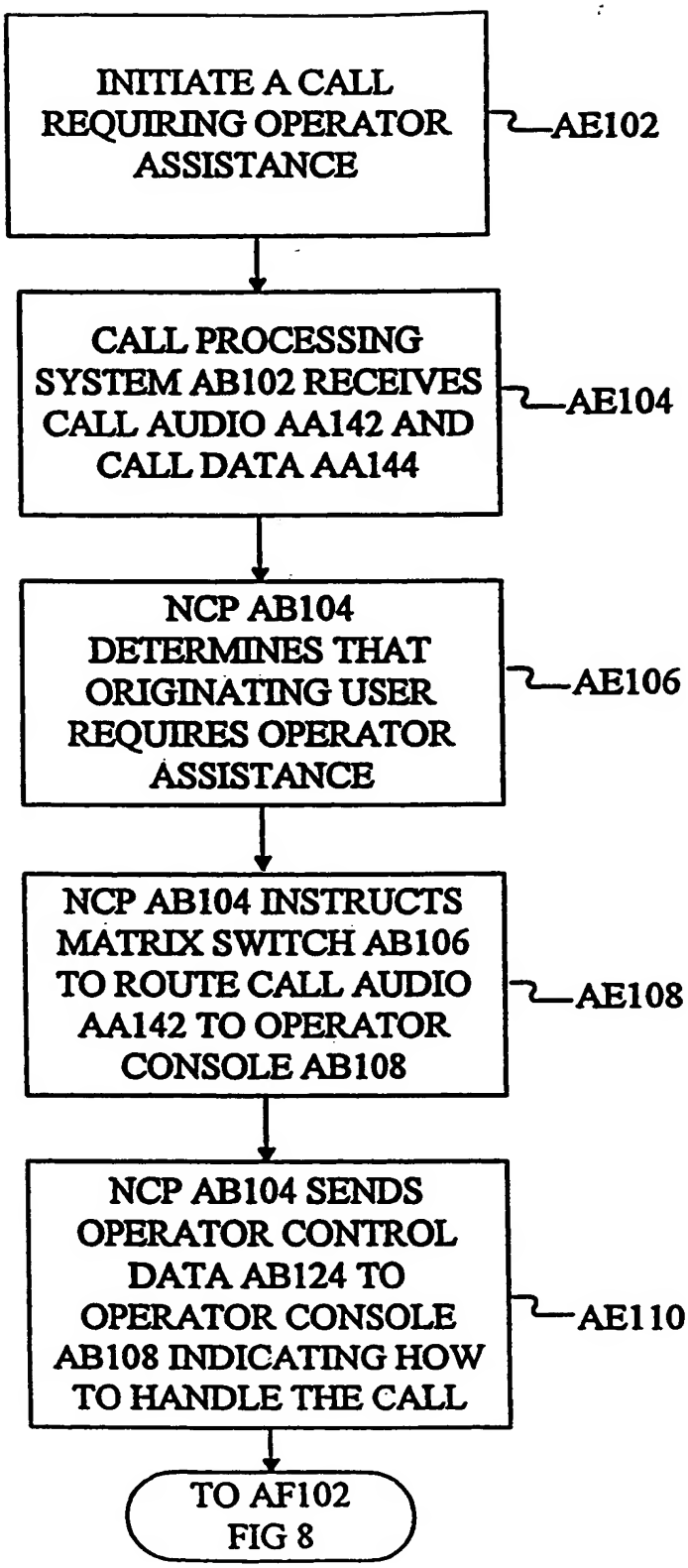

INITIATE A CALL REQUIRING OPERATOR ASSISTANCE
AE102
CALL PROCESSING SYSTEM AB102 RECEIVES CALL AUDIO AA142 AND CALL DATA AA144
AE104
NCP AB104 DETERMINES THAT ORIGINATING USER REQUIRES OPERATOR ASSISTANCE
AE106
NCP AB104 INSTRUCTS MATRIX SWITCH AB106 TO ROUTE CALL AUDIO AA142 TO OPERATOR CONSOLE AB108
AE108
NCP AB104 SENDS OPERATOR CONTROL DATA AB124 TO OPERATOR CONSOLE AB108 INDICATING HOW TO HANDLE THE CALL
AE110
TO AF102 FIG 8

FIG 7

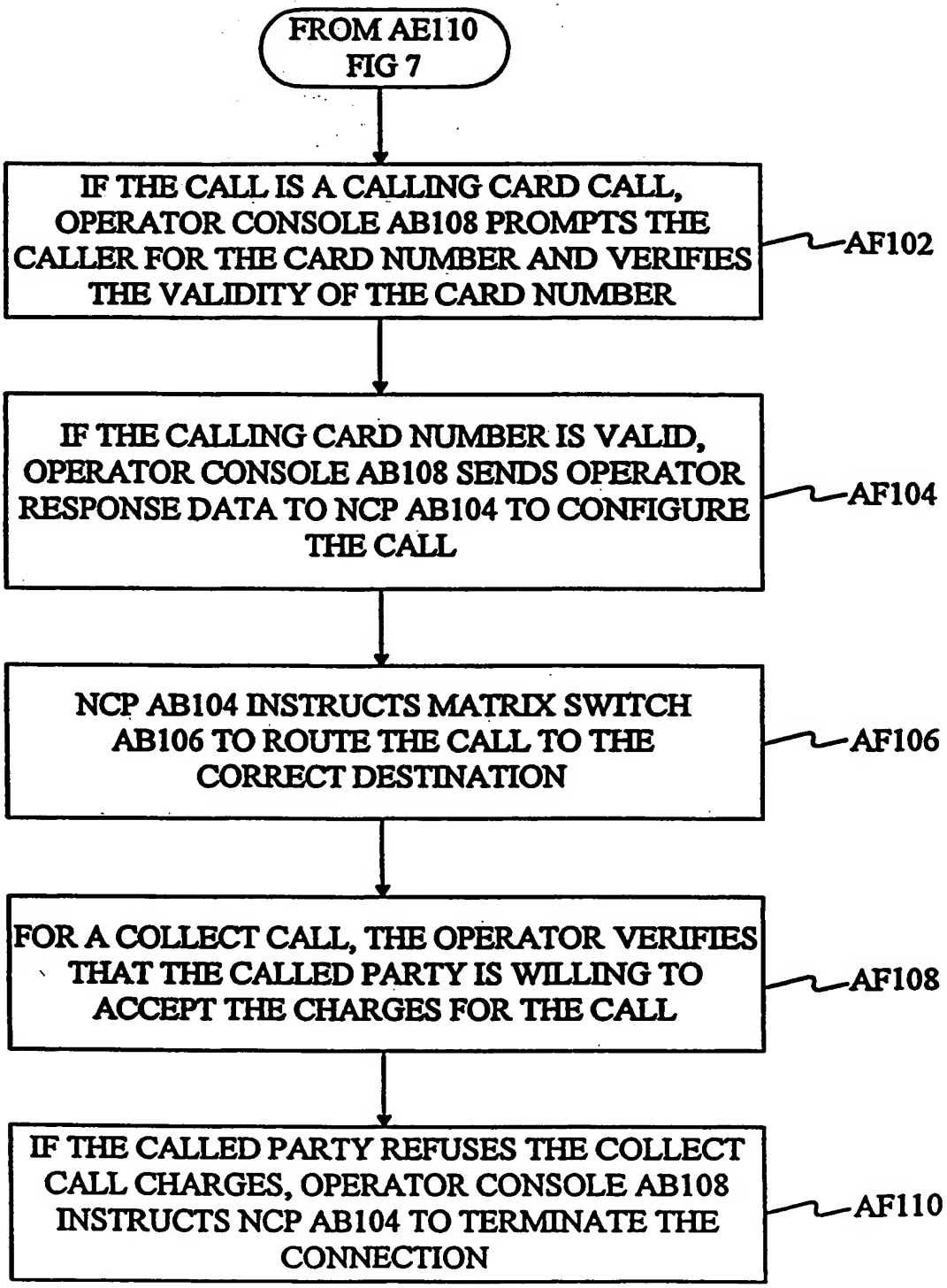

FROM AE110
FIG 7
IF THE CALL IS A CALLING CARD CALL, OPERATOR CONSOLE AB108 PROMPTS THE CALLER FOR THE CARD NUMBER AND VERIFIES THE VALIDITY OF THE CARD NUMBER
AF102
IF THE CALLING CARD NUMBER IS VALID, OPERATOR CONSOLE AB108 SENDS OPERATOR RESPONSE DATA TO NCP AB104 TO CONFIGURE THE CALL
AF104
NCP AB104 INSTRUCTS MATRIX SWITCH AB106 TO ROUTE THE CALL TO THE CORRECT DESTINATION
AF106
FOR A COLLECT CALL, THE OPERATOR VERIFIES THAT THE CALLED PARTY IS WILLING TO ACCEPT THE CHARGES FOR THE CALL
AF108
IF THE CALLED PARTY REFUSES THE COLLECT CALL CHARGES, OPERATOR CONSOLE AB108 INSTRUCTS NCP AB104 TO TERMINATE THE CONNECTION
AF110

FIG 8

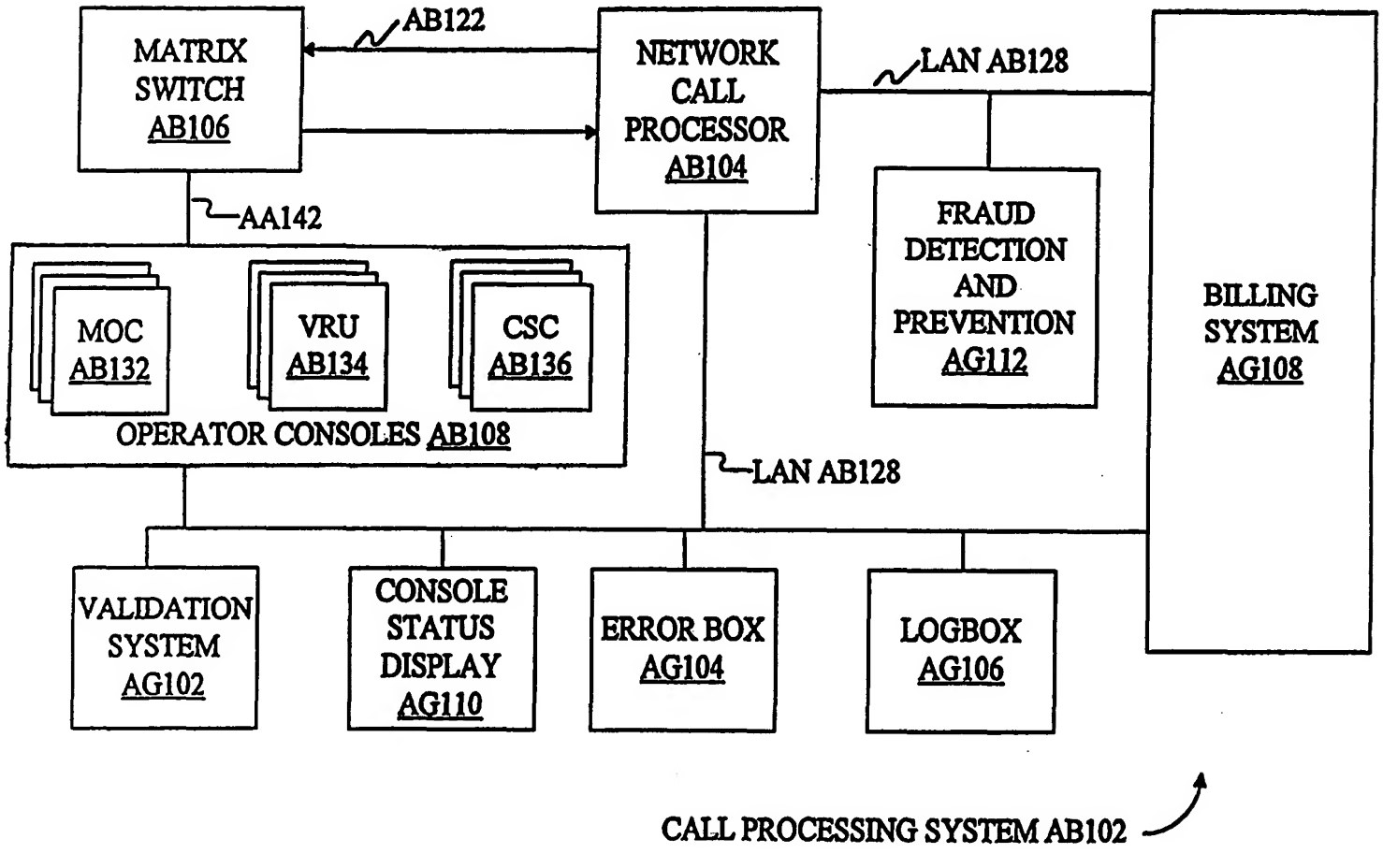

MATRIX SWITCH AB106
AB122
NETWORK CALL PROCESSOR AB104
LAN AB128
FRAUD DETECTION AND PREVENTION AG112
BILLING SYSTEM AG108
AA142
MOC AB132
VRU AB134
CSC AB136
OPERATOR CONSOLES AB108
LAN AB128
VALIDATION SYSTEM AG102
CONSOLE STATUS DISPLAY AG110
ERROR BOX AG104
LOGBOX AG106
CALL PROCESSING SYSTEM AB102

FIG 9

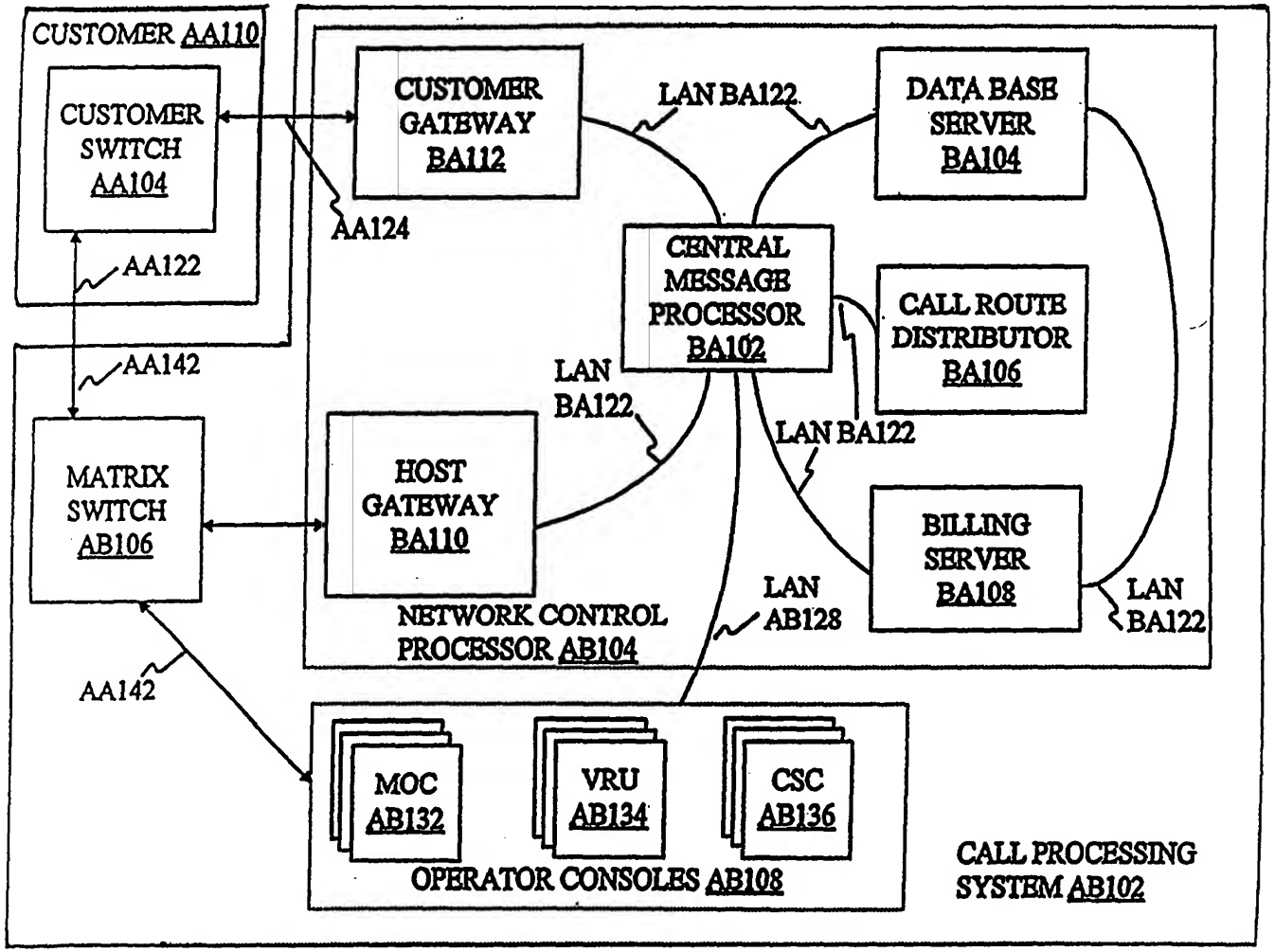

CUSTOMER AA110
CUSTOMER SWITCH AA104
AA122
AA142
AA124
CUSTOMER GATEWAY BA112
LAN BA122
DATA BASE SERVER BA104
CENTRAL MESSAGE PROCESSOR BA102
CALL ROUTE DISTRIBUTOR BA106
LAN BA122
LAN BA122
MATRIX SWITCH AB106
HOST GATEWAY BA110
BILLING SERVER BA108
LAN BA122
NETWORK CONTROL PROCESSOR AB104
LAN AB128
AA142
MOC AB132
VRU AB134
CSC AB136
OPERATOR CONSOLES AB108
CALL PROCESSING SYSTEM AB102

FIG 10

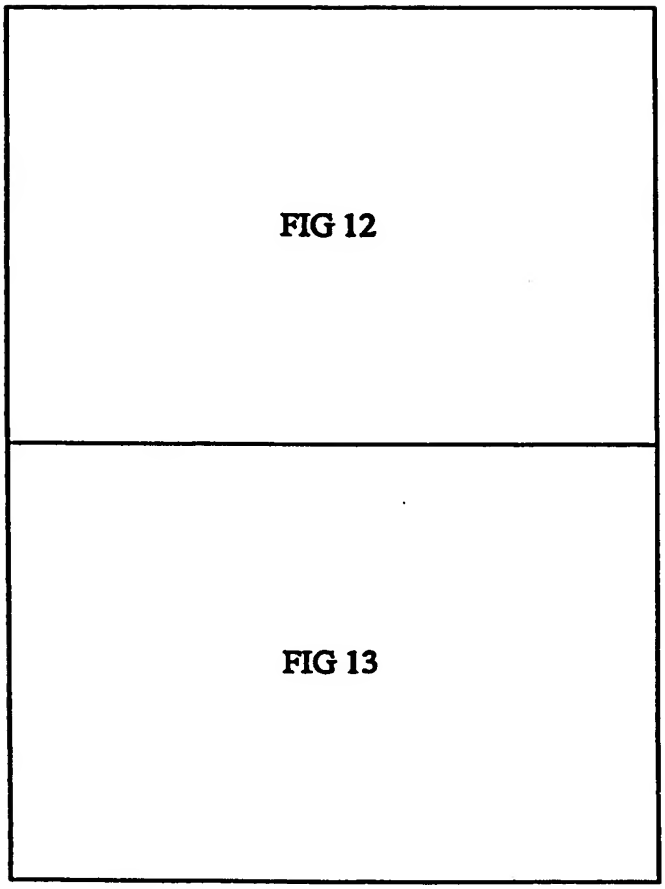


FIG 11

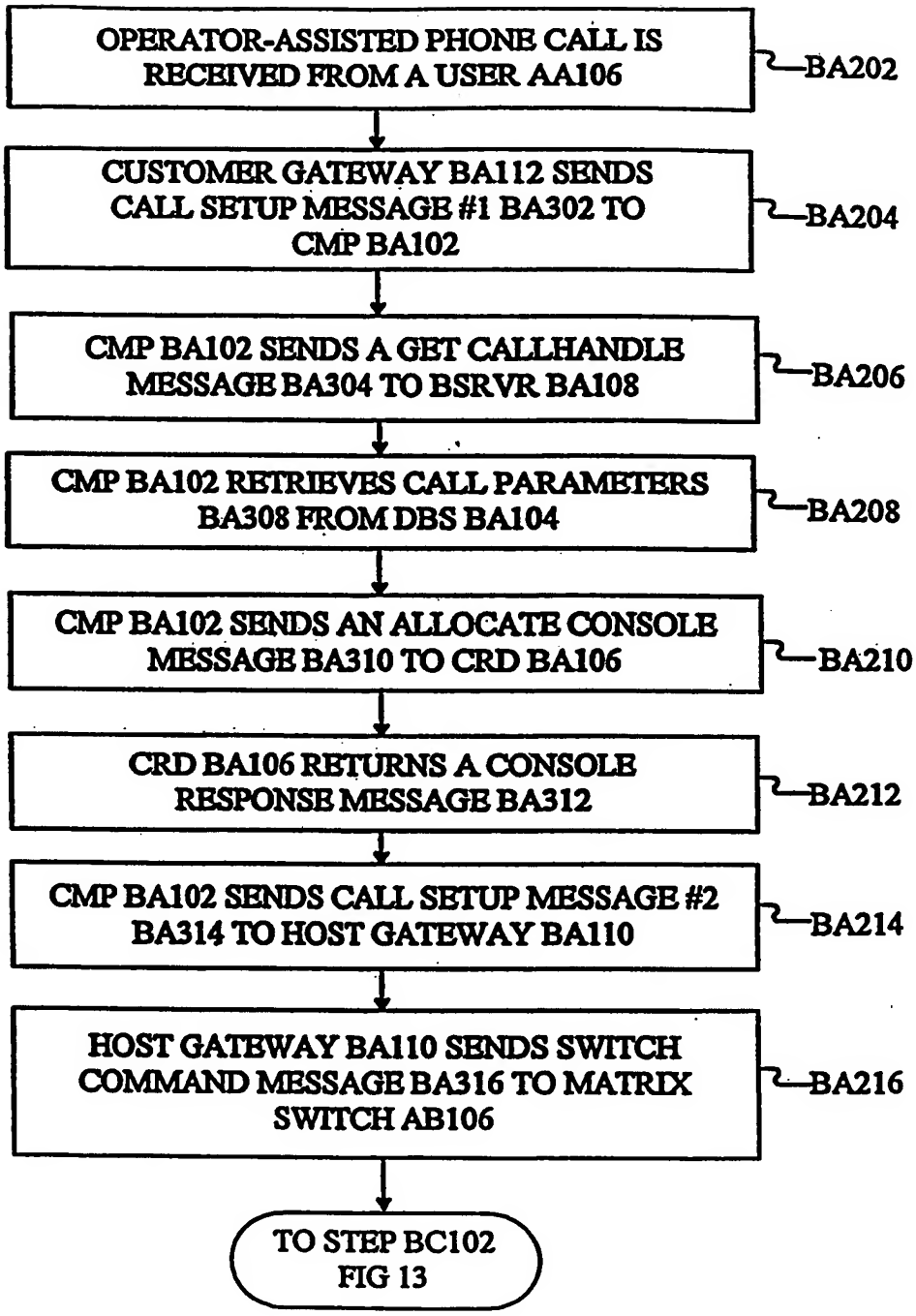

OPERATOR-ASSISTED PHONE CALL IS RECEIVED FROM A USER AA106
BA202
CUSTOMER GATEWAY BA112 SENDS CALL SETUP MESSAGE #1 BA302 TO CMP BA102
BA204
CMP BA102 SENDS A GET CALLHANDLE MESSAGE BA304 TO BSRVR BA108
BA206
CMP BA102 RETRIEVES CALL PARAMETERS BA308 FROM DBS BA104
BA208
CMP BA102 SENDS AN ALLOCATE CONSOLE MESSAGE BA310 TO CRD BA106
BA210
CRD BA106 RETURNS A CONSOLE RESPONSE MESSAGE BA312
BA212
CMP BA102 SENDS CALL SETUP MESSAGE #2 BA314 TO HOST GATEWAY BA110
BA214
HOST GATEWAY BA110 SENDS SWITCH COMMAND MESSAGE BA316 TO MATRIX SWITCH AB106
BA216
TO STEP BC102 FIG 13

FIG 12

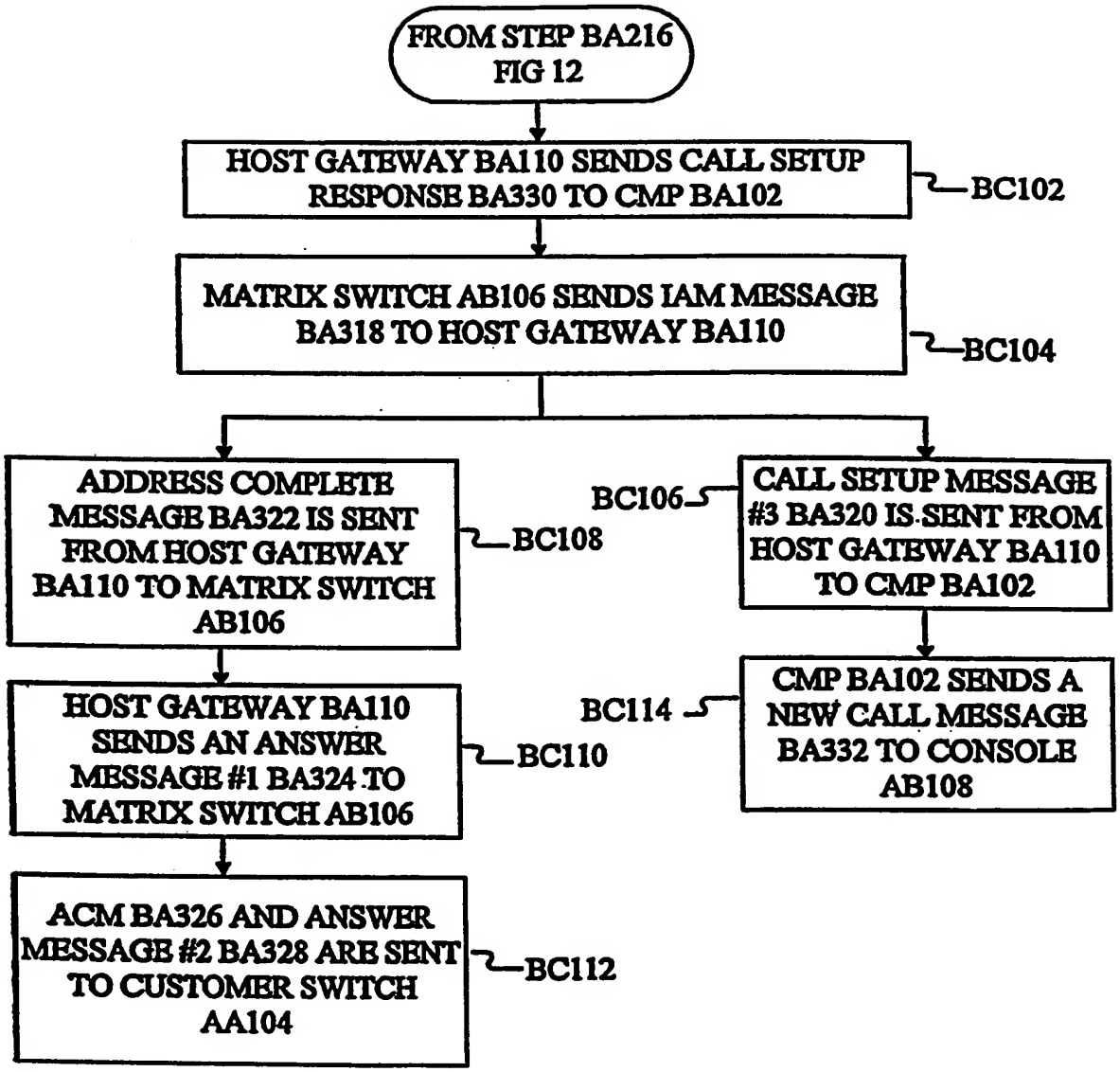

FROM STEP BA216 FIG 12
HOST GATEWAY BA110 SENDS CALL SETUP RESPONSE BA330 TO CMP BA102
BC102
MATRIX SWITCH AB106 SENDS IAM MESSAGE BA318 TO HOST GATEWAY BA110
BC104
ADDRESS COMPLETE MESSAGE BA322 IS SENT FROM HOST GATEWAY BA110 TO MATRIX SWITCH AB106
BC108
BC106
CALL SETUP MESSAGE #3 BA320 IS SENT FROM HOST GATEWAY BA110 TO CMP BA102
HOST GATEWAY BA110 SENDS AN ANSWER MESSAGE #1 BA324 TO MATRIX SWITCH AB106
BC110
BC114
CMP BA102 SENDS A NEW CALL MESSAGE BA332 TO CONSOLE AB108
ACM BA326 AND ANSWER MESSAGE #2 BA328 ARE SENT TO CUSTOMER SWITCH AA104
BC112

FIG 13

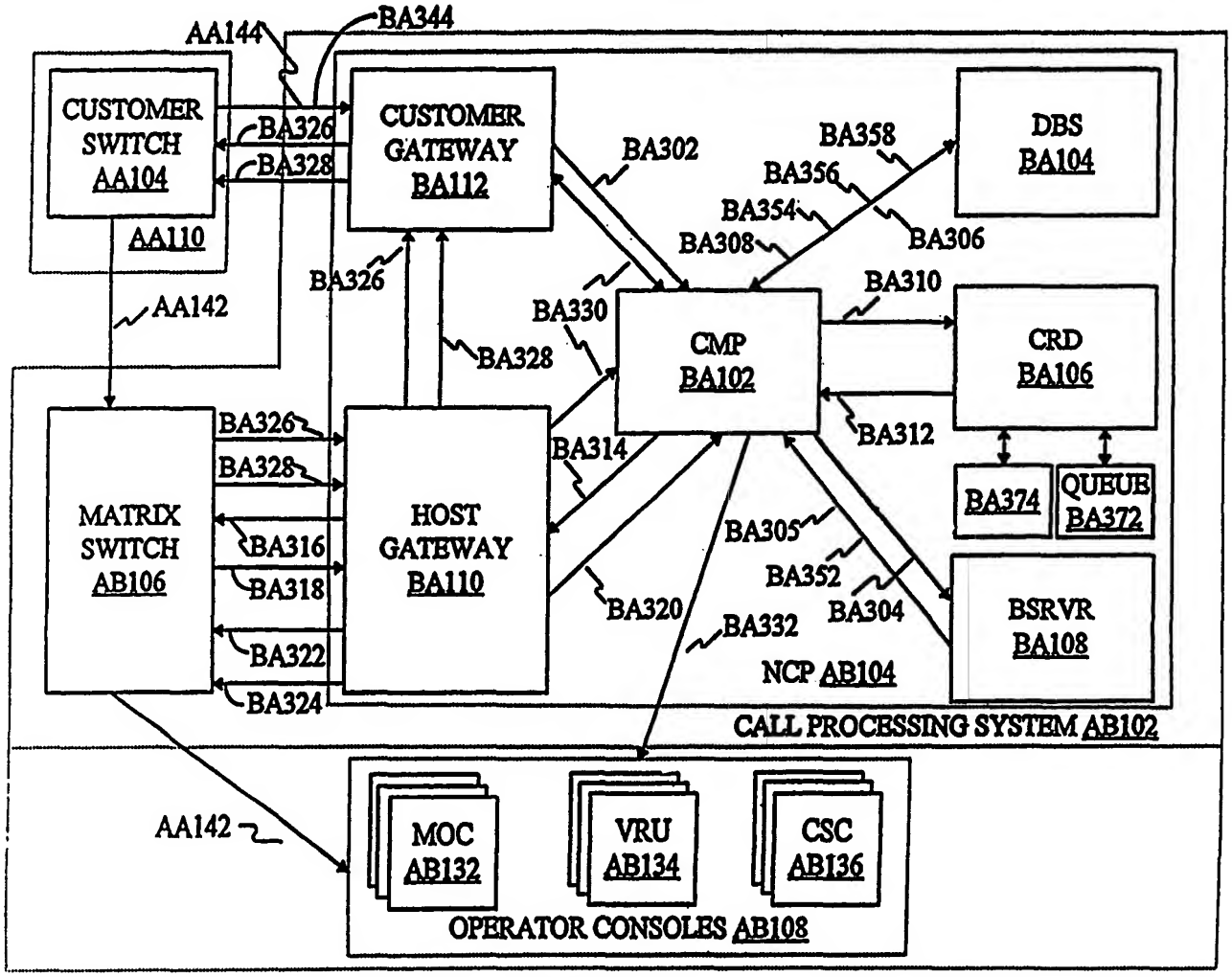

AA144
BA344
CUSTOMER SWITCH AA104
AA110
BA326
BA328
CUSTOMER GATEWAY BA112
BA302
BA358
DBS BA104
BA356
BA354
BA306
BA308
BA326
AA142
BA330
BA310
BA328
CMP BA102
CRD BA106
BA326
BA328
BA314
BA312
MATRIX SWITCH AB106
BA316
BA318
HOST GATEWAY BA110
BA374
QUEUE BA372
BA305
BA352
BA304
BA320
BA332
BSRVR BA108
BA322
BA324
NCP AB104
CALL PROCESSING SYSTEM AB102
AA142
MOC AB132
VRU AB134
CSC AB136
OPERATOR CONSOLES AB108

FIG 14

FIG 16	FIG 17

FIG 15

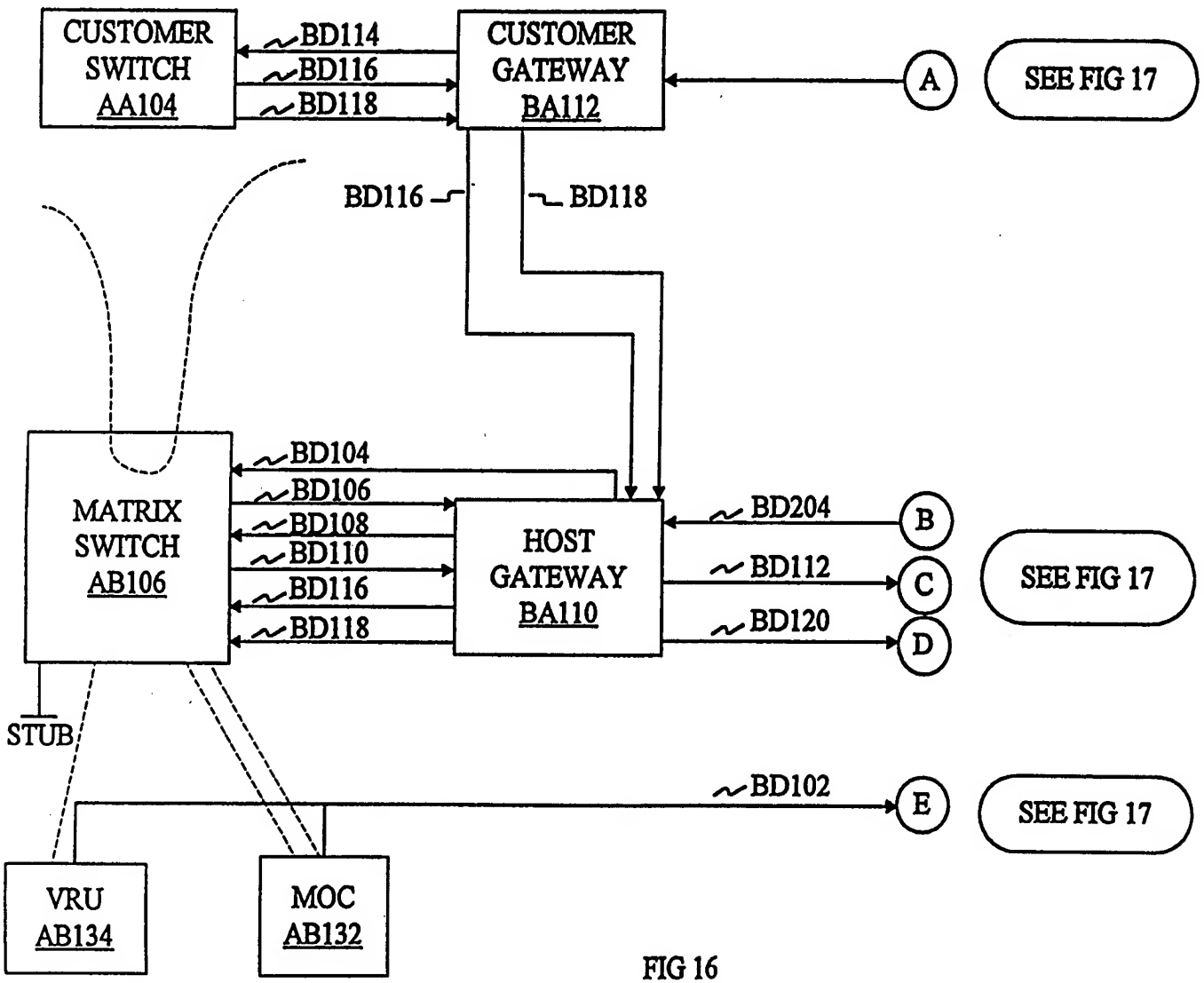

CUSTOMER SWITCH AA104
BD114
BD116
BD118
CUSTOMER GATEWAY BA112
A
SEE FIG 17
BD116
BD118
MATRIX SWITCH AB106
BD104
BD106
BD108
BD110
BD116
BD118
HOST GATEWAY BA110
BD204
B
BD112
C
BD120
D
SEE FIG 17
STUB
BD102
E
SEE FIG 17
VRU AB134
MOC AB132

FIG 16

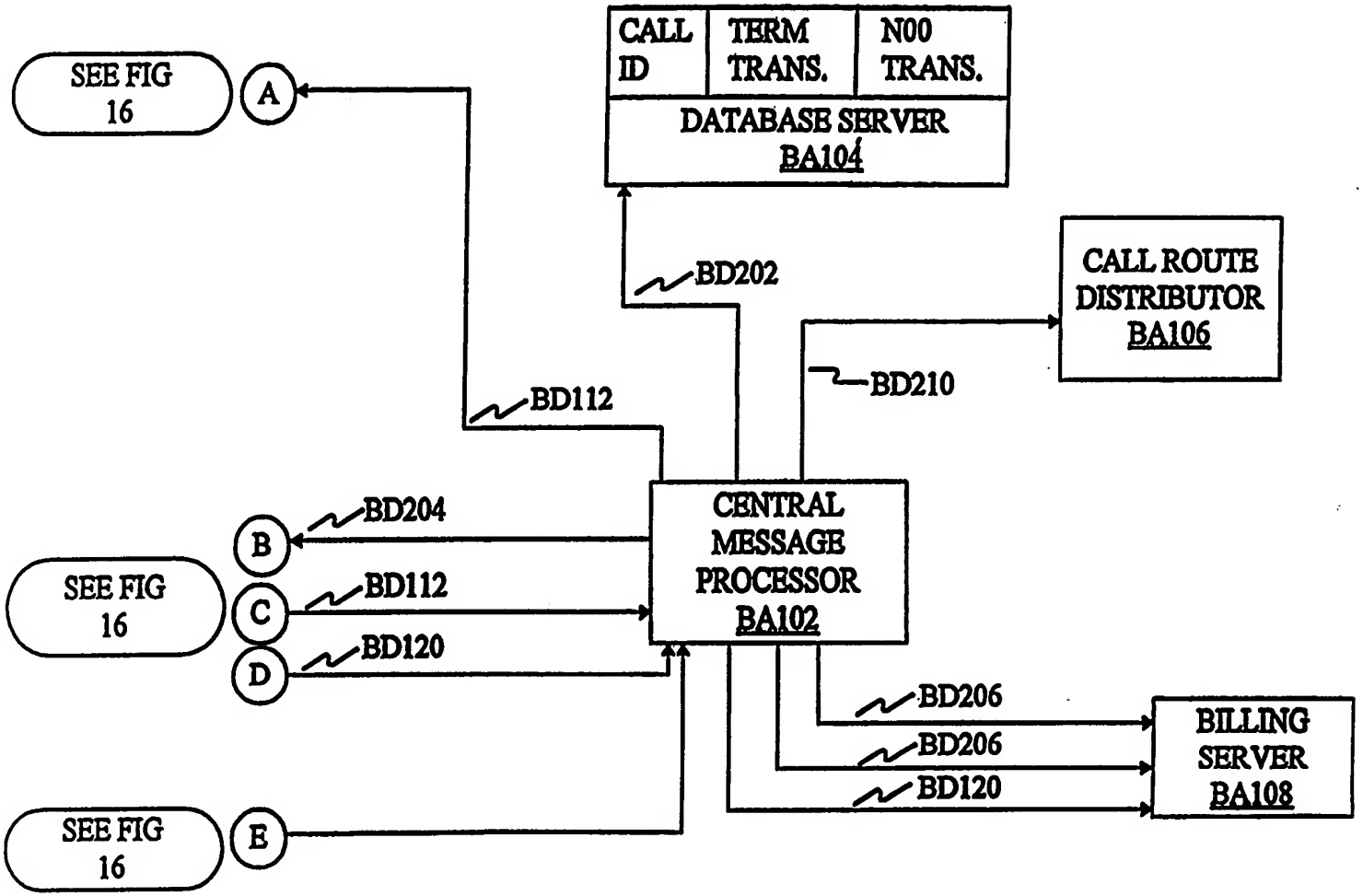

SEE FIG 16
A
CALL ID
TERM TRANS.
N00 TRANS.
DATABASE SERVER BA104
BD202
CALL ROUTE DISTRIBUTOR BA106
BD210
BD112
CENTRAL MESSAGE PROCESSOR BA102
BD204
B
SEE FIG 16
C
BD112
D
BD120
BD206
BD206
BD120
BILLING SERVER BA108
SEE FIG 16
E

FIG 17

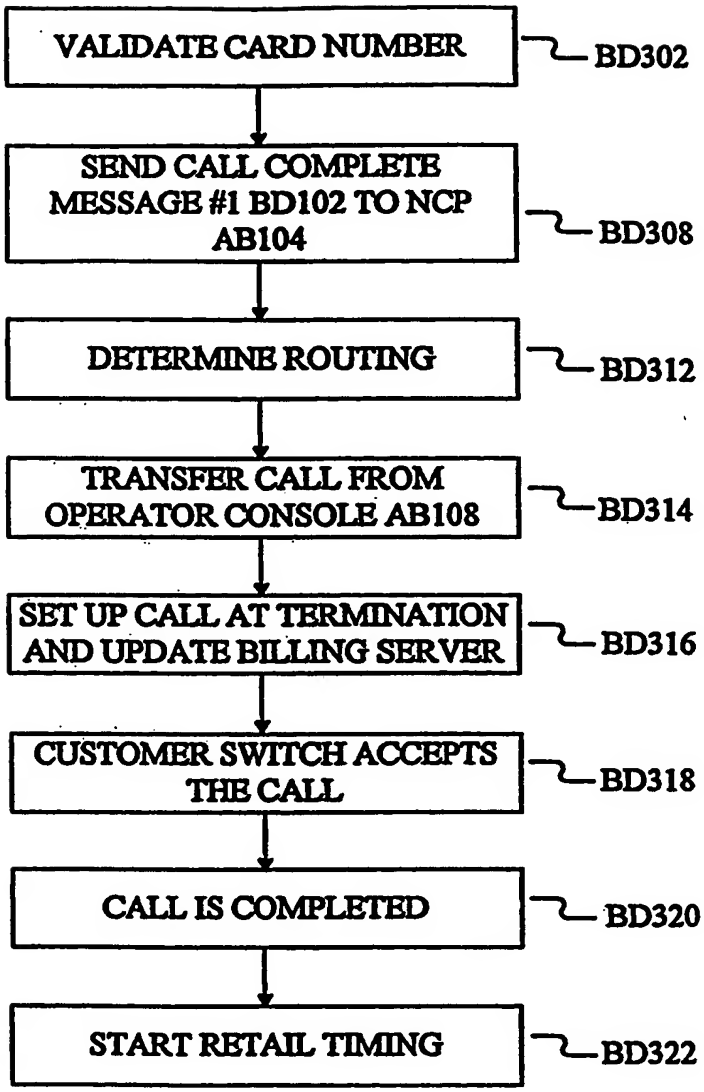

VALIDATE CARD NUMBER
BD302
SEND CALL COMPLETE MESSAGE #1 BD102 TO NCP AB104
BD308
DETERMINE ROUTING
BD312
TRANSFER CALL FROM OPERATOR CONSOLE AB108
BD314
SET UP CALL AT TERMINATION AND UPDATE BILLING SERVER
BD316
CUSTOMER SWITCH ACCEPTS THE CALL
BD318
CALL IS COMPLETED
BD320
START RETAIL TIMING
BD322

FIG 18

FIG 20	FIG 21

FIG 19

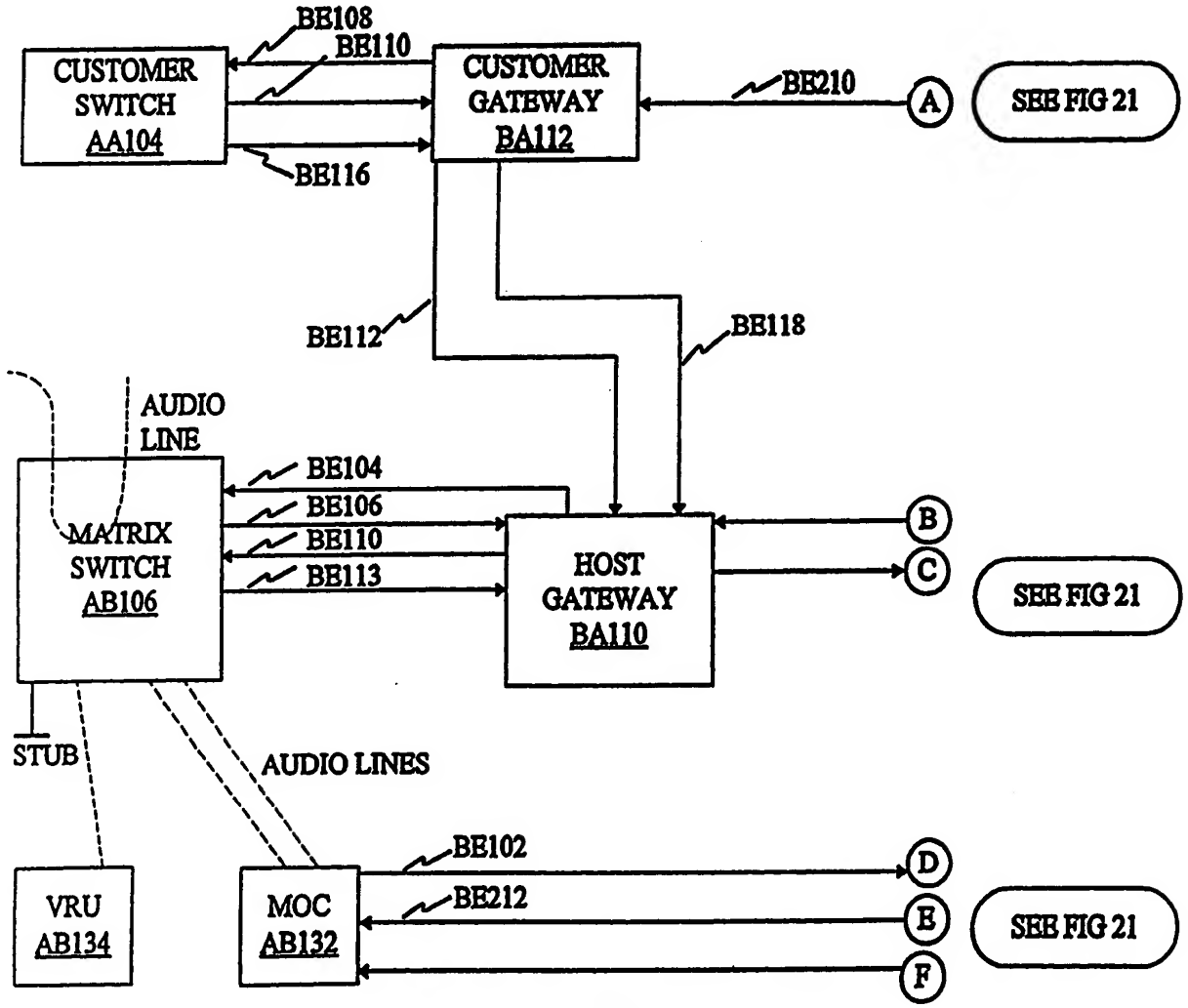

BE108
BE110
CUSTOMER SWITCH AA104
CUSTOMER GATEWAY BA112
BE210
A
SEE FIG 21
BE116
BE112
BE118
AUDIO LINE
BE104
BE106
BE110
BE113
MATRIX SWITCH AB106
HOST GATEWAY BA110
B
C
SEE FIG 21
STUB
AUDIO LINES
BE102
BE212
VRU AB134
MOC AB132
D
E
F
SEE FIG 21

FIG 20

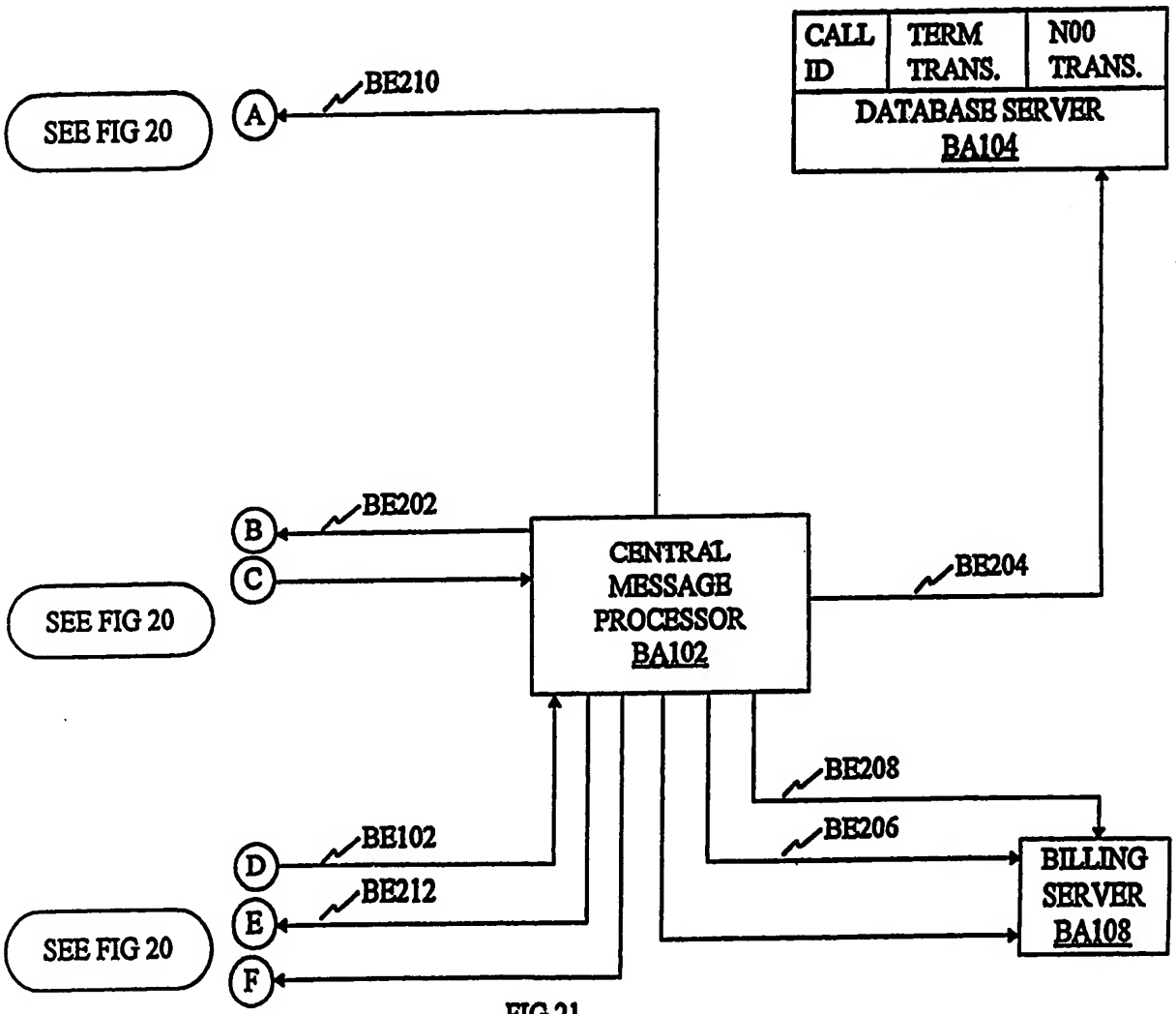

CALL ID
TERM TRANS.
N00 TRANS.
DATABASE SERVER BA104
SEE FIG 20
A
BE210
B
BE202
C
SEE FIG 20
CENTRAL MESSAGE PROCESSOR BA102
BE204
BE208
BE206
BILLING SERVER BA108
D
BE102
E
BE212
SEE FIG 20
F

FIG 21

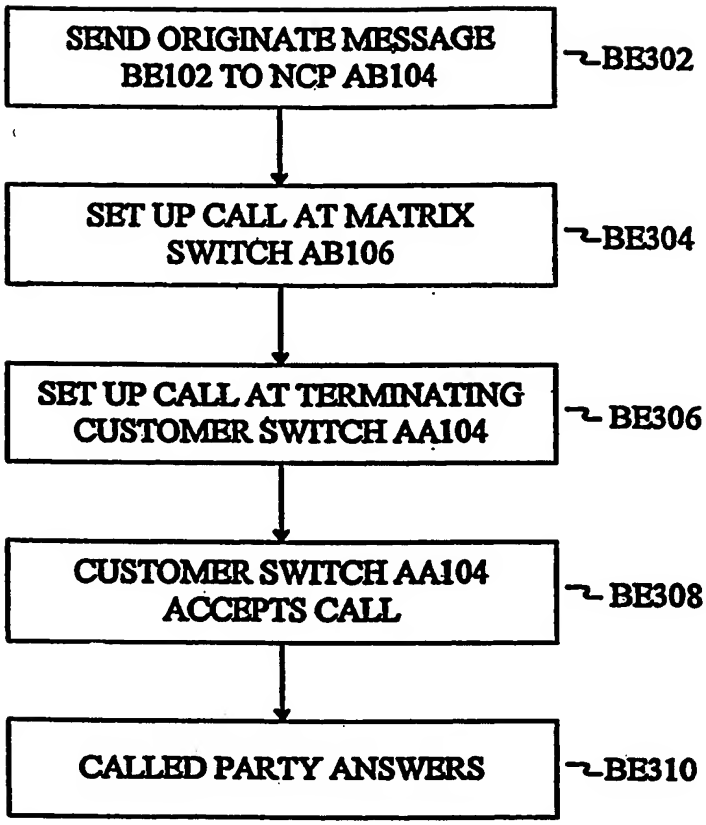

SEND ORIGINATE MESSAGE BE102 TO NCP AB104
BE302
SET UP CALL AT MATRIX SWITCH AB106
BE304
SET UP CALL AT TERMINATING CUSTOMER SWITCH AA104
BE306
CUSTOMER SWITCH AA104 ACCEPTS CALL
BE308
CALLED PARTY ANSWERS
BE310

FIG 22

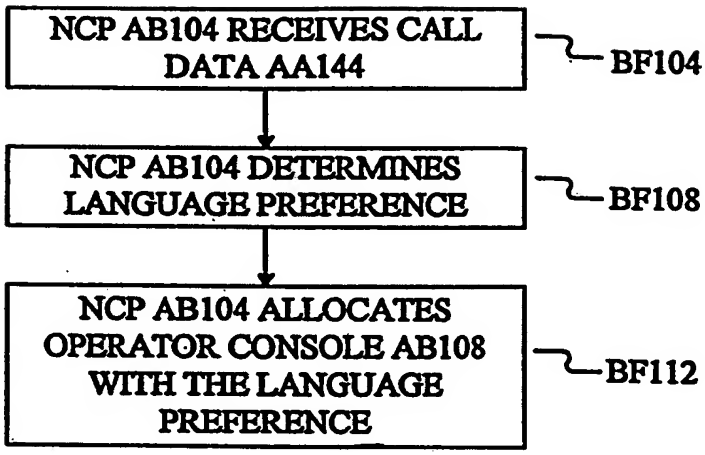

NCP AB104 RECEIVES CALL DATA AA144
BF104
NCP AB104 DETERMINES LANGUAGE PREFERENCE
BF108
NCP AB104 ALLOCATES OPERATOR CONSOLE AB108 WITH THE LANGUAGE PREFERENCE
BF112

FIG 23

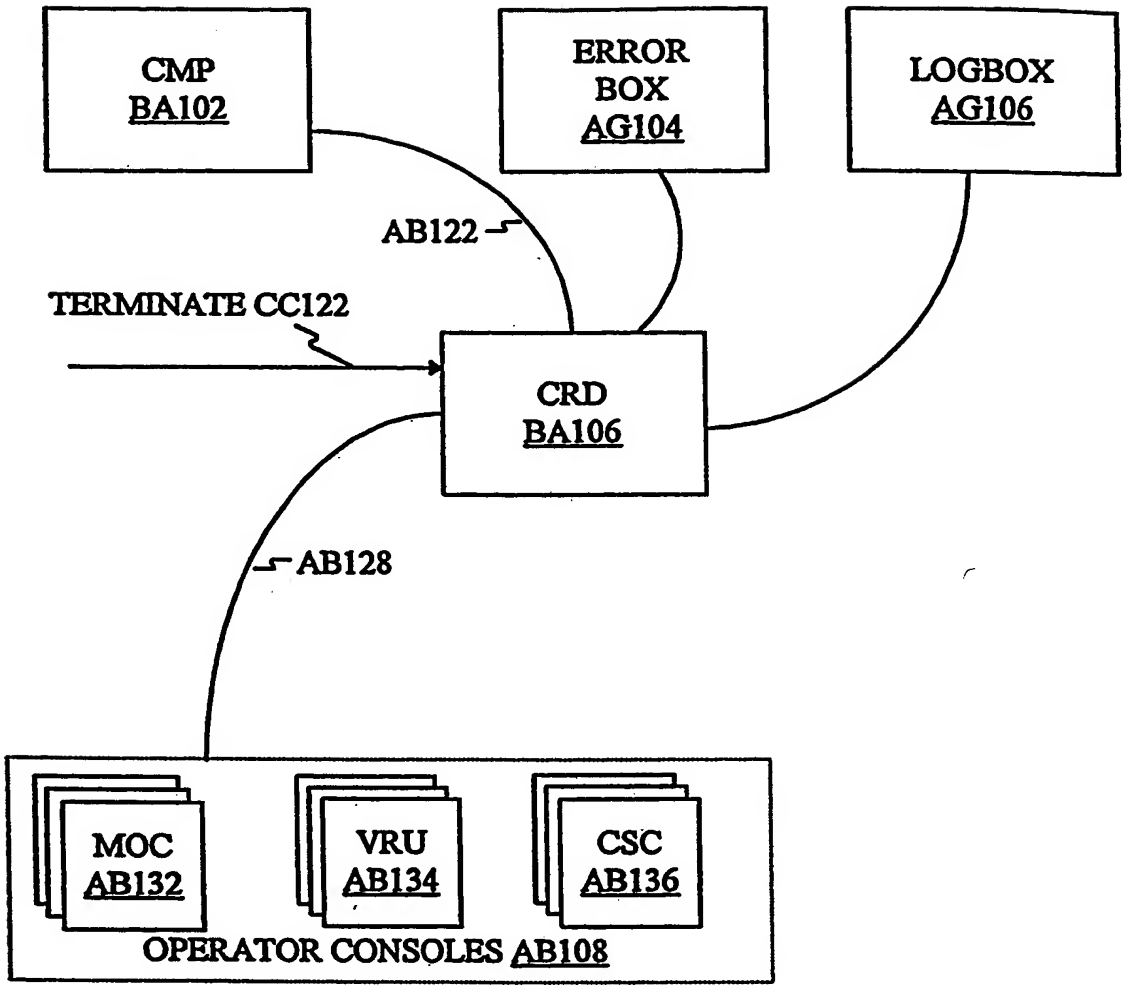

CMP
BA102
ERROR
BOX
AG104
LOGBOX
AG106
AB122
TERMINATE CC122
CRD
BA106
AB128
MOC
AB132
VRU
AB134
CSC
AB136
OPERATOR CONSOLES AB108

FIG 24

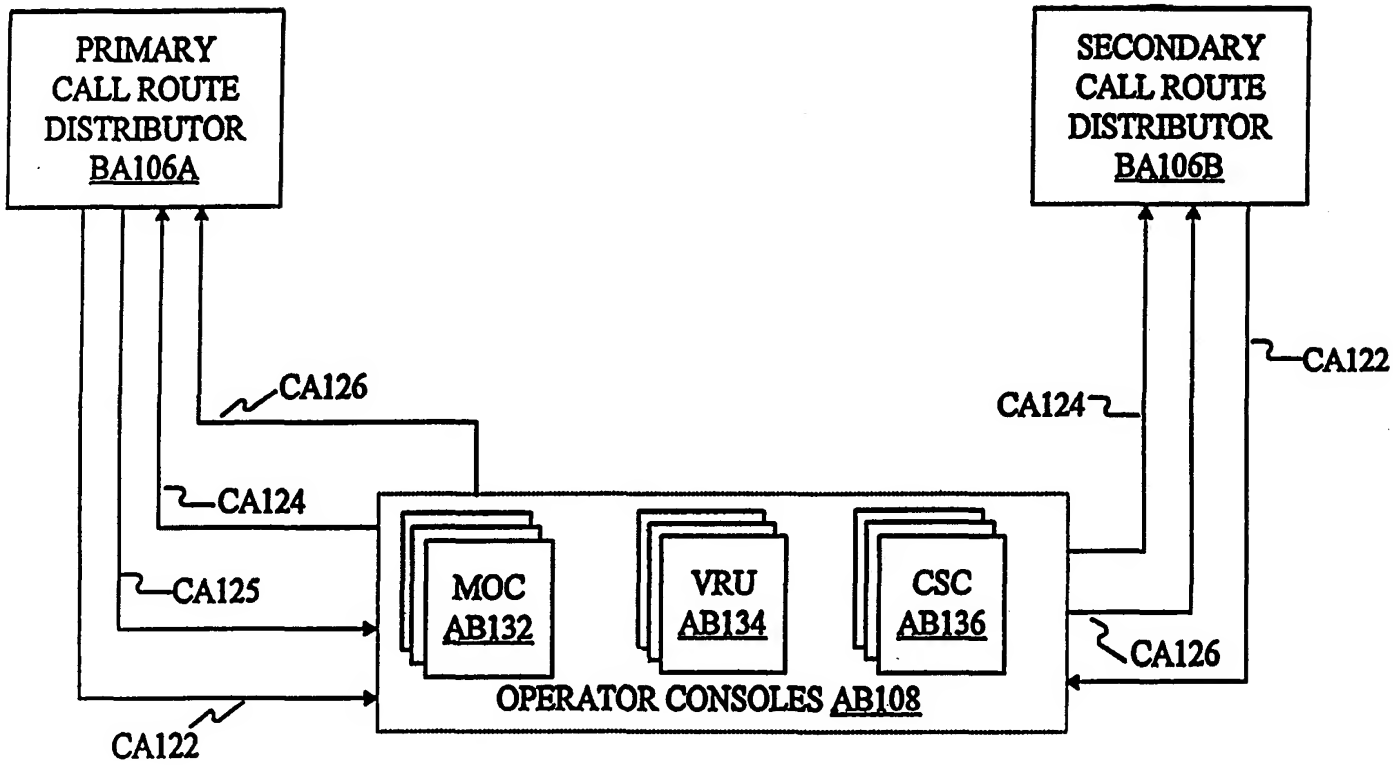

PRIMARY
CALL ROUTE
DISTRIBUTOR
BA106A
SECONDARY
CALL ROUTE
DISTRIBUTOR
BA106B
CA126
CA124
CA125
CA122
CA124
CA122
MOC
AB132
VRU
AB134
CSC
AB136
CA126
OPERATOR CONSOLES AB108

FIG 25

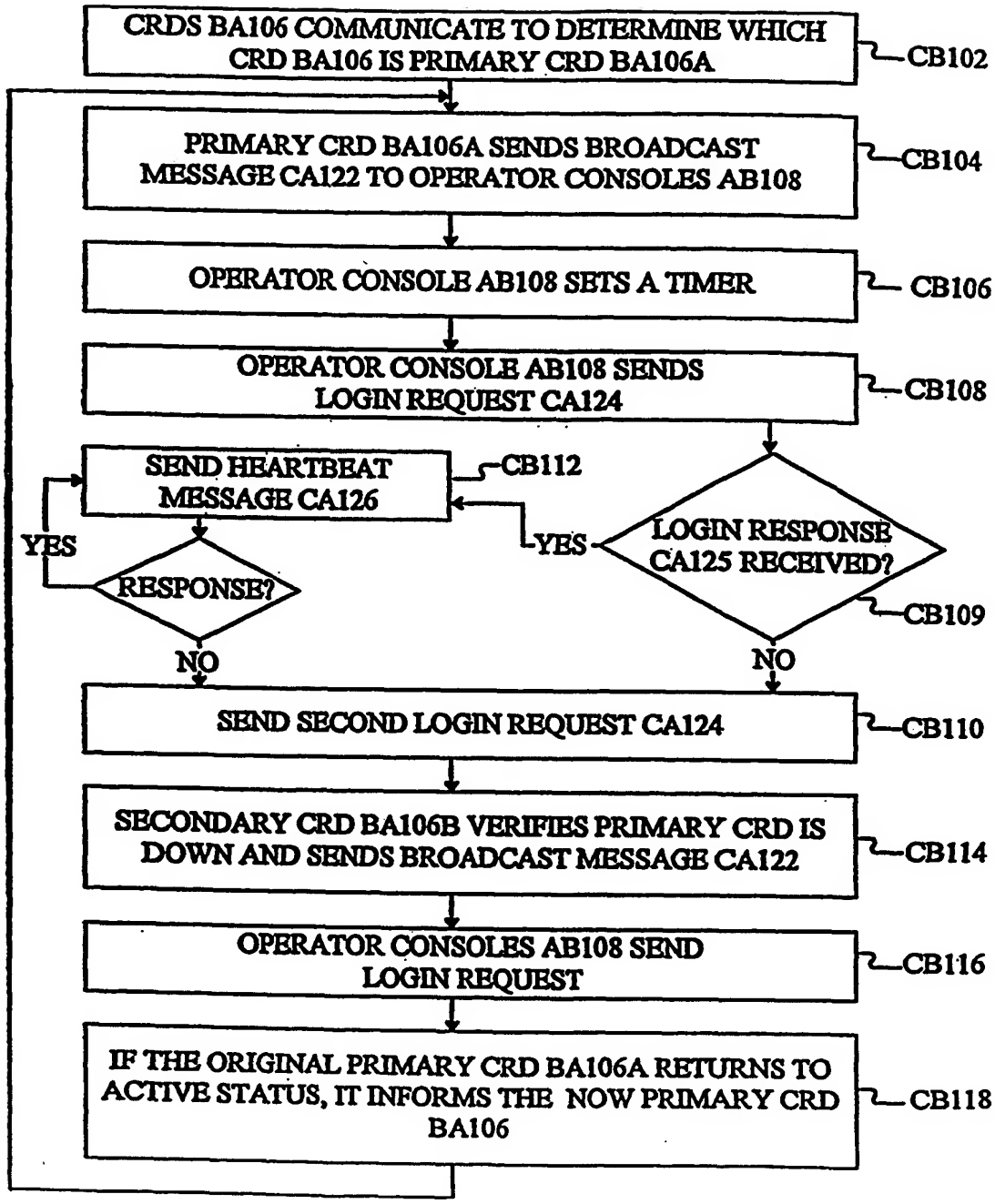

CRDS BA106 COMMUNICATE TO DETERMINE WHICH CRD BA106 IS PRIMARY CRD BA106A
CB102
PRIMARY CRD BA106A SENDS BROADCAST MESSAGE CA122 TO OPERATOR CONSOLES AB108
CB104
OPERATOR CONSOLE AB108 SETS A TIMER
CB106
OPERATOR CONSOLE AB108 SENDS LOGIN REQUEST CA124
CB108
SEND HEARTBEAT MESSAGE CA126
CB112
YES
RESPONSE?
NO
YES
LOGIN RESPONSE CA125 RECEIVED?
CB109
NO
SEND SECOND LOGIN REQUEST CA124
CB110
SECONDARY CRD BA106B VERIFIES PRIMARY CRD IS DOWN AND SENDS BROADCAST MESSAGE CA122
CB114
OPERATOR CONSOLES AB108 SEND LOGIN REQUEST
CB116
IF THE ORIGINAL PRIMARY CRD BA106A RETURNS TO ACTIVE STATUS, IT INFORMS THE NOW PRIMARY CRD BA106
CB118

FIG 26

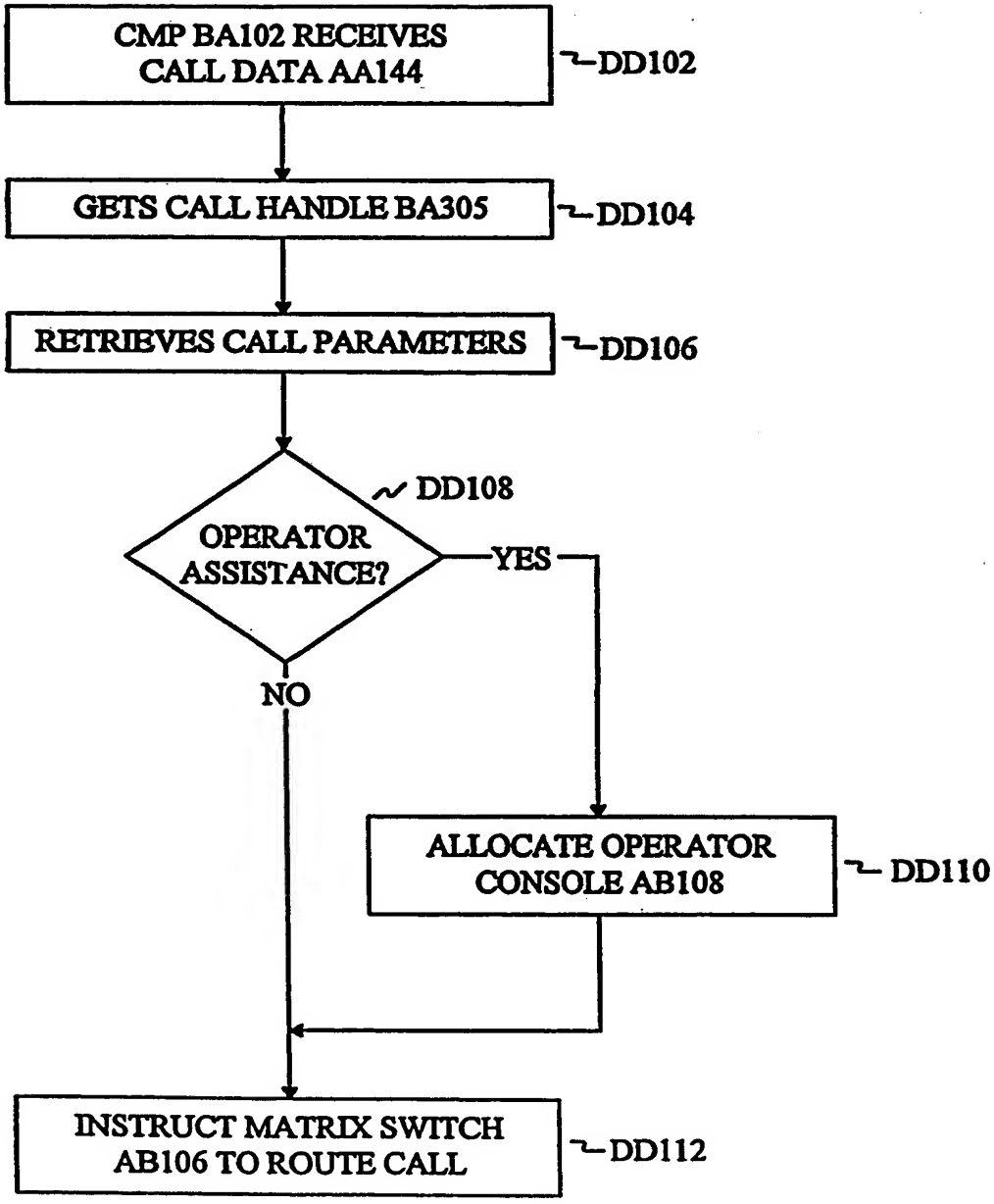

CMP BA102 RECEIVES CALL DATA AA144
DD102
GETS CALL HANDLE BA305
DD104
RETRIEVES CALL PARAMETERS
DD106
DD108
OPERATOR ASSISTANCE?
YES
NO
ALLOCATE OPERATOR CONSOLE AB108
DD110
INSTRUCT MATRIX SWITCH AB106 TO ROUTE CALL
DD112

FIG 27

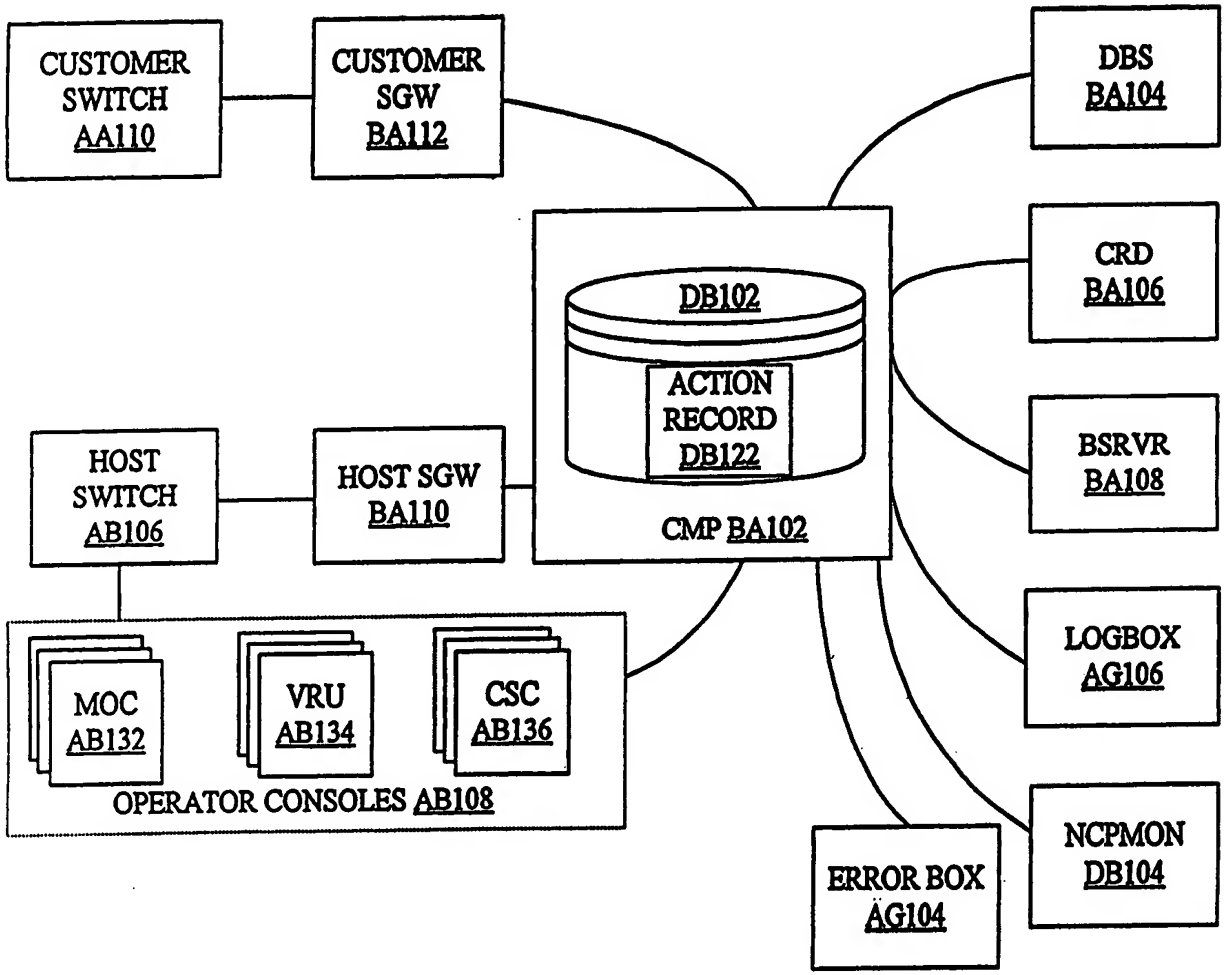

CUSTOMER SWITCH AA110
CUSTOMER SGW BA112
DBS BA104
CRD BA106
DB102
ACTION RECORD DB122
BSRVR BA108
HOST SWITCH AB106
HOST SGW BA110
CMP BA102
LOGBOX AG106
MOC AB132
VRU AB134
CSC AB136
OPERATOR CONSOLES AB108
ERROR BOX AG104
NCPMON DB104

FIG 28

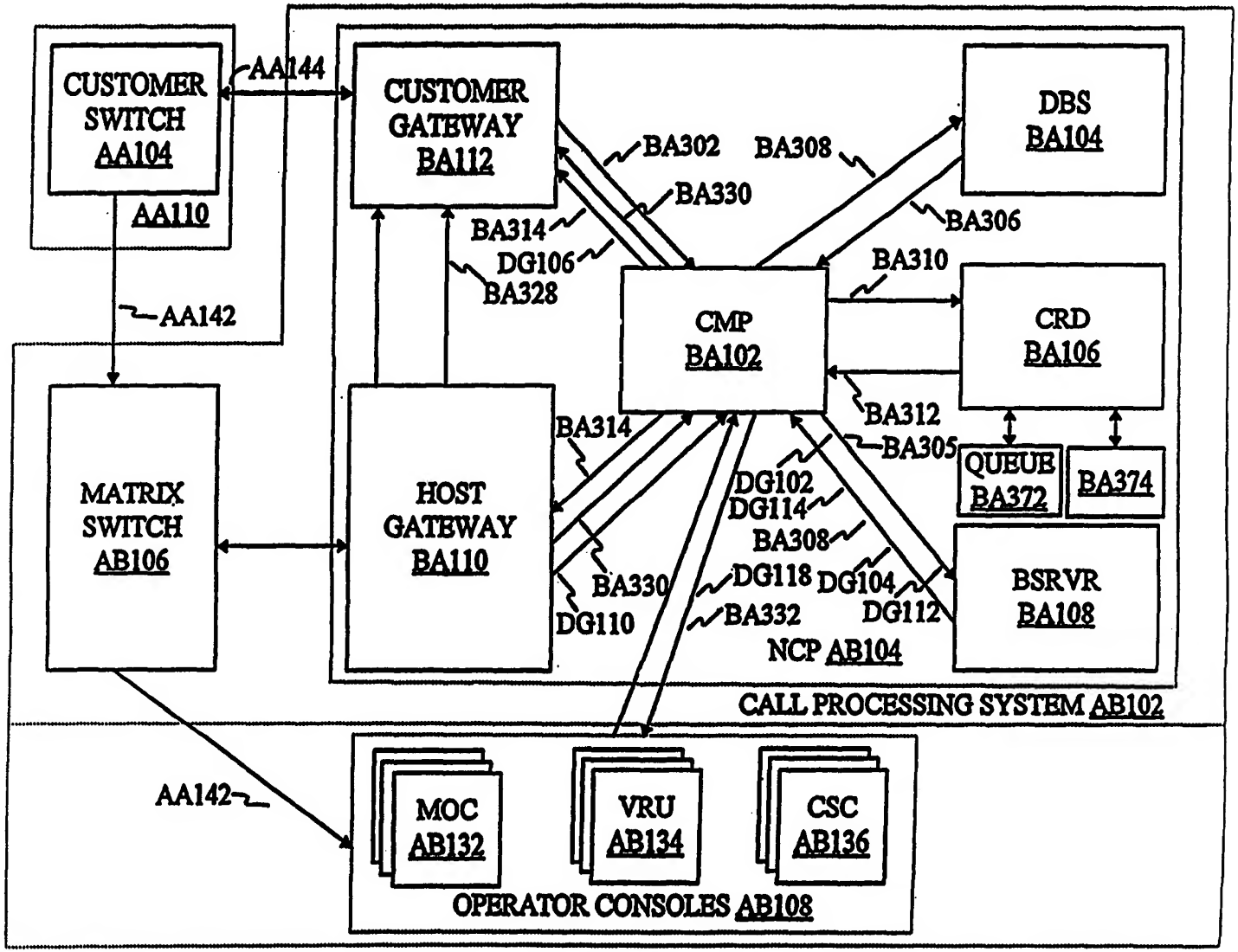

CUSTOMER SWITCH AA104
AA110
AA144
AA142
CUSTOMER GATEWAY BA112
DBS BA104
BA302
BA308
BA330
BA306
BA314
DG106
BA328
BA310
CMP BA102
CRD BA106
BA312
BA305
QUEUE BA372
BA374
MATRIX SWITCH AB106
HOST GATEWAY BA110
BA314
DG102
DG114
BA308
BA330
DG110
DG118
DG104
DG112
BA332
BSRVR BA108
NCP AB104
CALL PROCESSING SYSTEM AB102
AA142
MOC AB132
VRU AB134
CSC AB136
OPERATOR CONSOLES AB108

FIG 29

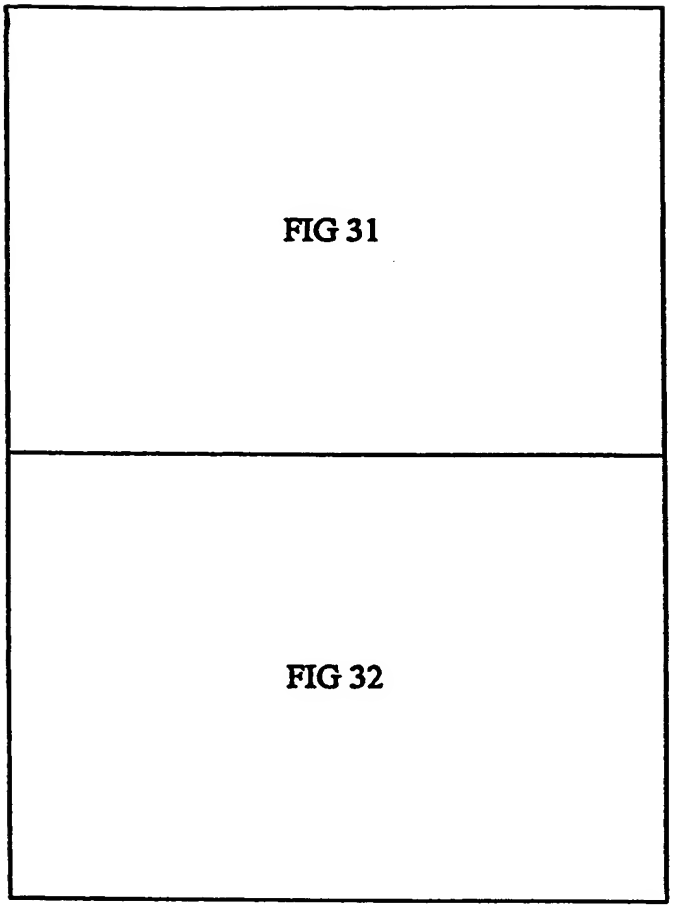


FIG 30

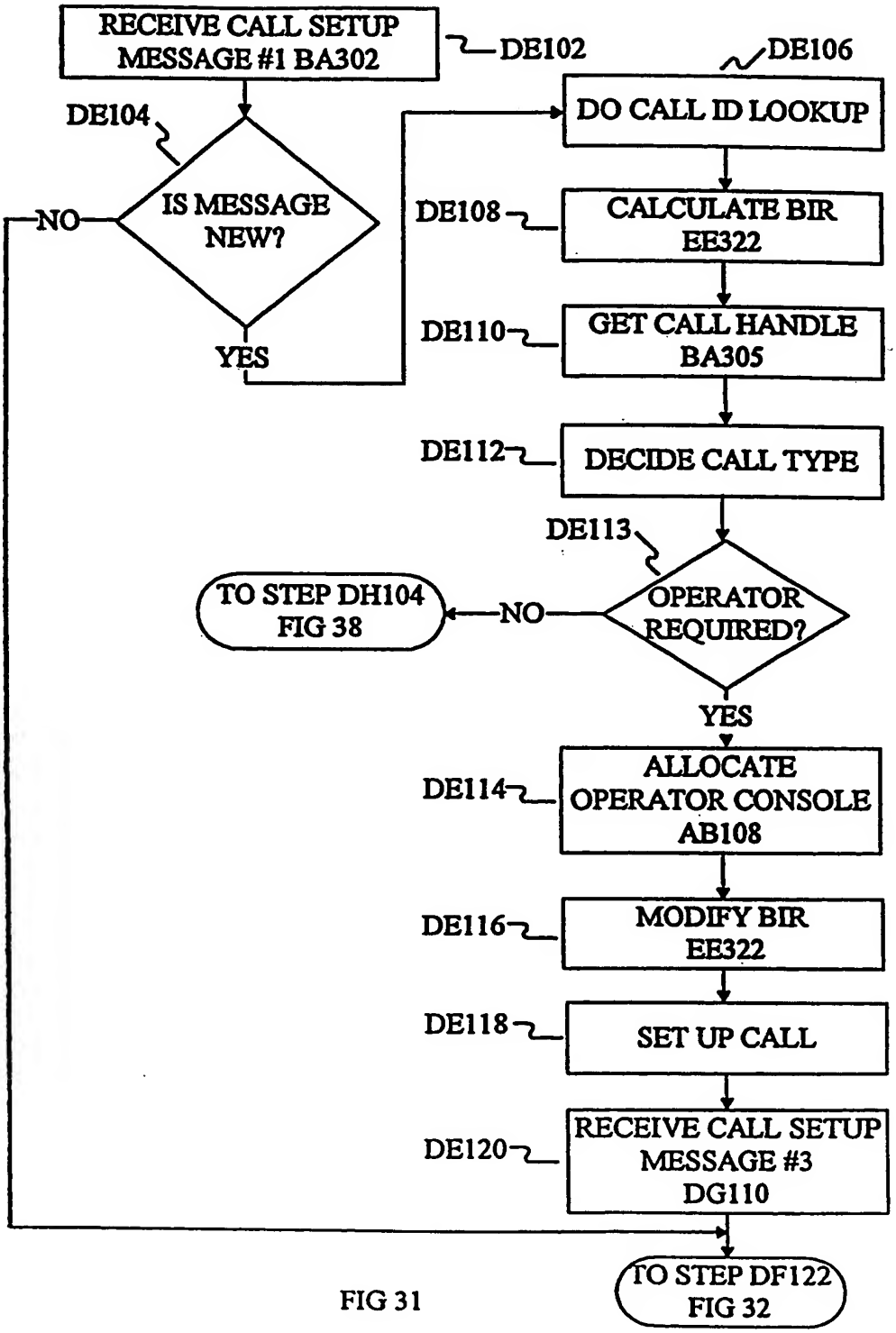

RECEIVE CALL SETUP MESSAGE #1 BA302
DE102
DE106
DE104
DO CALL ID LOOKUP
IS MESSAGE NEW?
NO
DE108
CALCULATE BIR EE322
YES
DE110
GET CALL HANDLE BA305
DE112
DECIDE CALL TYPE
DE113
TO STEP DH104 FIG 38
NO
OPERATOR REQUIRED?
YES
DE114
ALLOCATE OPERATOR CONSOLE AB108
DE116
MODIFY BIR EE322
DE118
SET UP CALL
DE120
RECEIVE CALL SETUP MESSAGE #3 DG110
TO STEP DF122 FIG 32

FIG 31

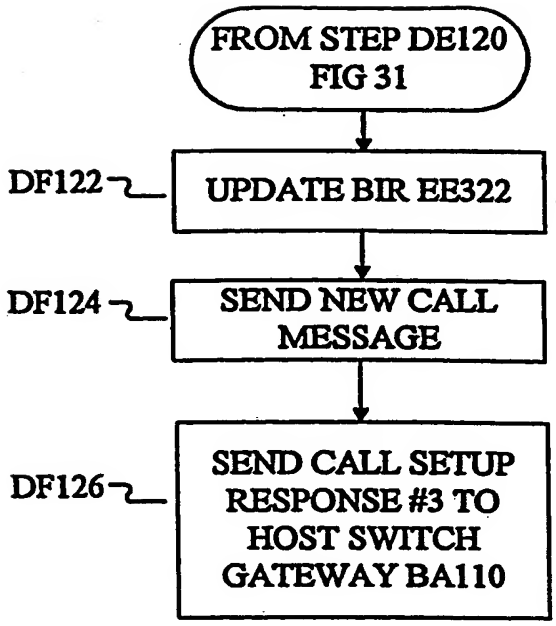

FROM STEP DE120
FIG 31
DF122
UPDATE BIR EE322
DF124
SEND NEW CALL MESSAGE
DF126
SEND CALL SETUP RESPONSE #3 TO HOST SWITCH GATEWAY BA110

FIG 32

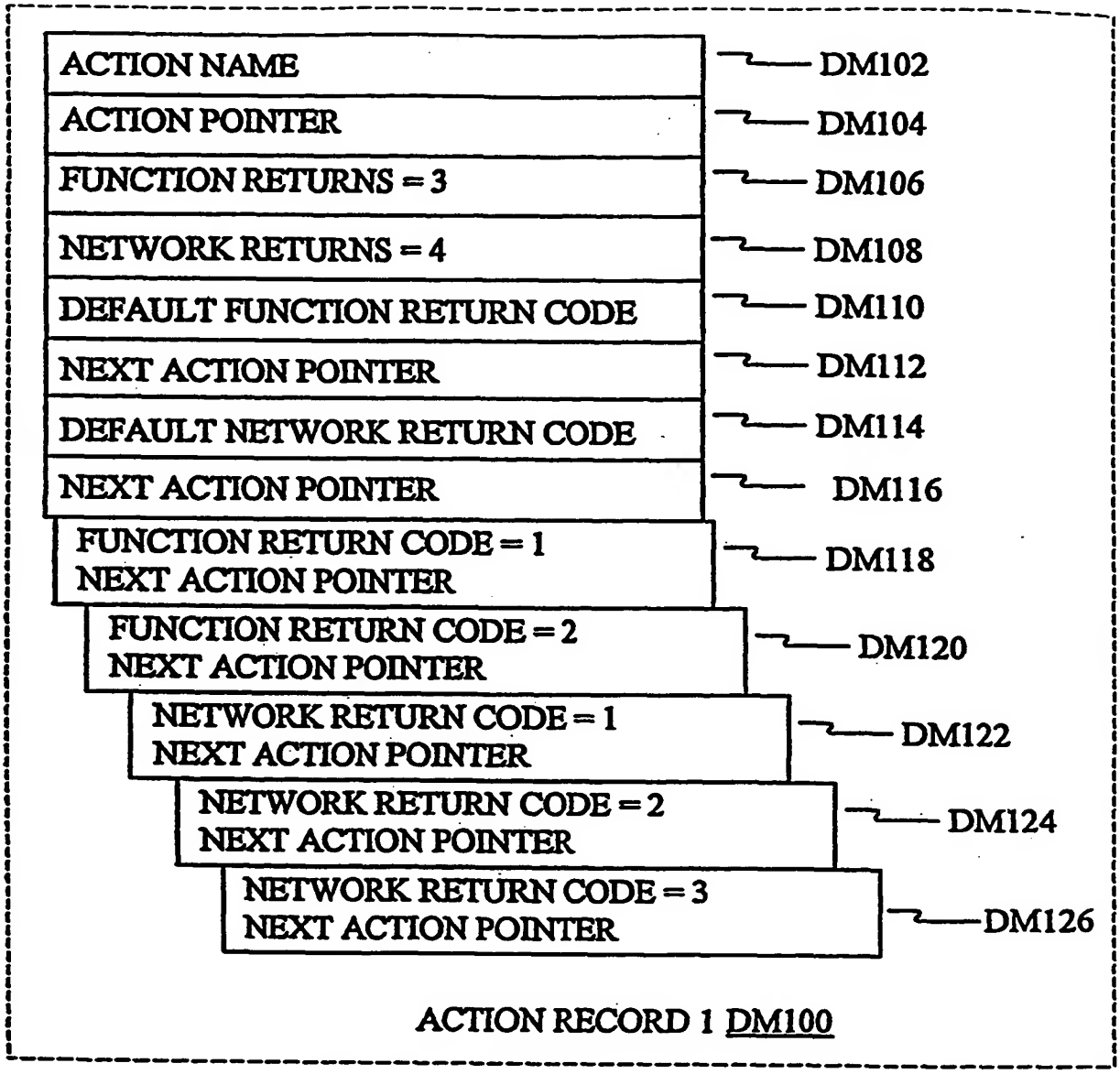

ACTION NAME
DM102
ACTION POINTER
DM104
FUNCTION RETURNS = 3
DM106
NETWORK RETURNS = 4
DM108
DEFAULT FUNCTION RETURN CODE
DM110
NEXT ACTION POINTER
DM112
DEFAULT NETWORK RETURN CODE
DM114
NEXT ACTION POINTER
DM116
FUNCTION RETURN CODE = 1
NEXT ACTION POINTER
DM118
FUNCTION RETURN CODE = 2
NEXT ACTION POINTER
DM120
NETWORK RETURN CODE = 1
NEXT ACTION POINTER
DM122
NETWORK RETURN CODE = 2
NEXT ACTION POINTER
DM124
NETWORK RETURN CODE = 3
NEXT ACTION POINTER
DM126
ACTION RECORD 1 DM100

FIG 33

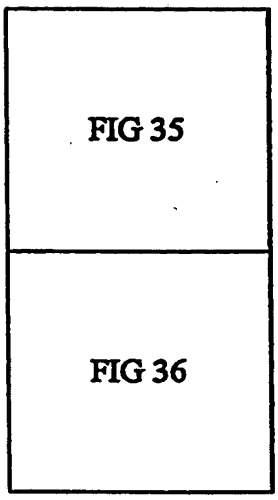


FIG 34

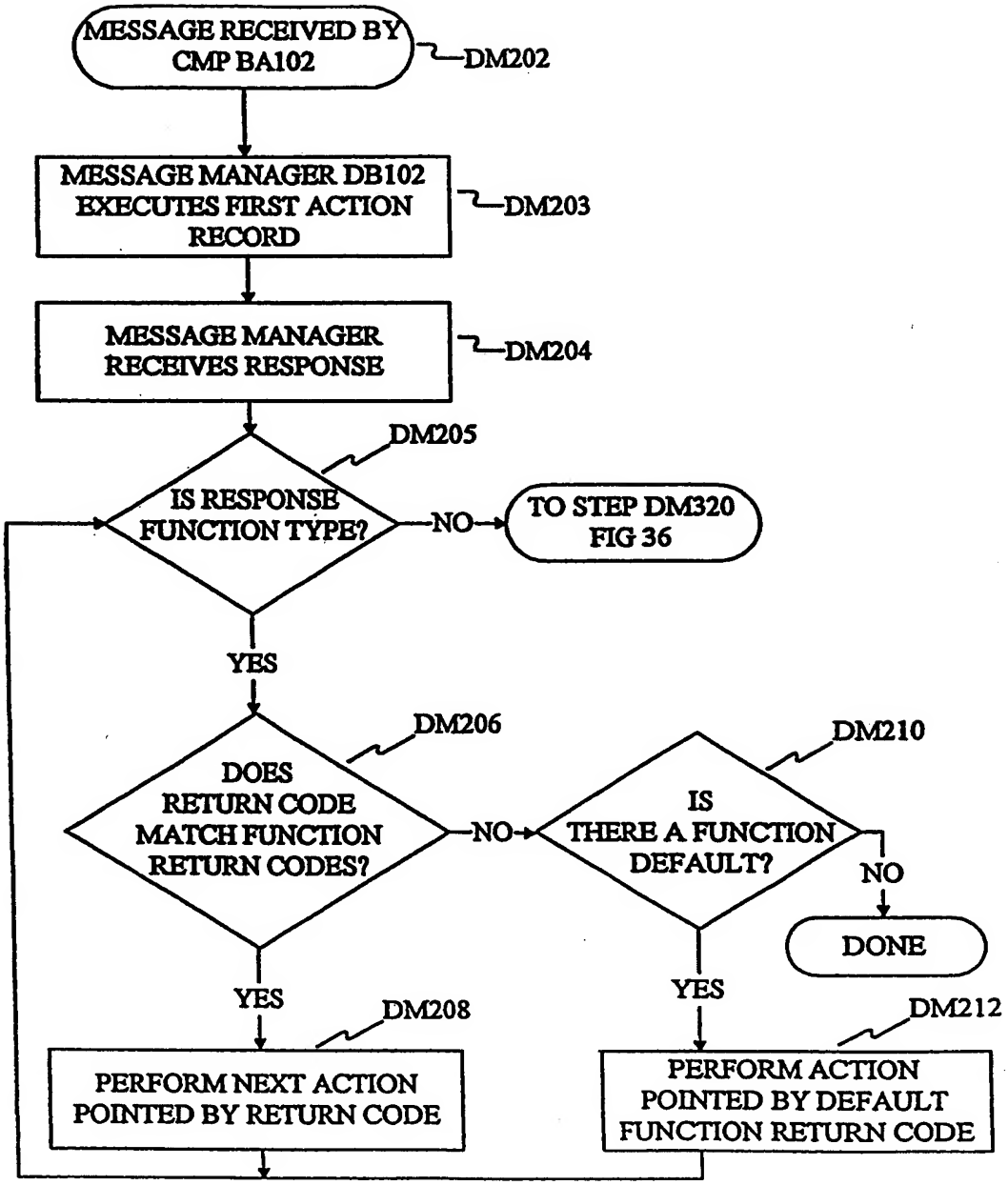

MESSAGE RECEIVED BY CMP BA102
DM202
MESSAGE MANAGER DB102 EXECUTES FIRST ACTION RECORD
DM203
MESSAGE MANAGER RECEIVES RESPONSE
DM204
DM205
IS RESPONSE FUNCTION TYPE?
NO
TO STEP DM320 FIG 36
YES
DM206
DOES RETURN CODE MATCH FUNCTION RETURN CODES?
NO
DM210
IS THERE A FUNCTION DEFAULT?
NO
DONE
YES
YES
DM208
PERFORM NEXT ACTION POINTED BY RETURN CODE
DM212
PERFORM ACTION POINTED BY DEFAULT FUNCTION RETURN CODE

FIG 35

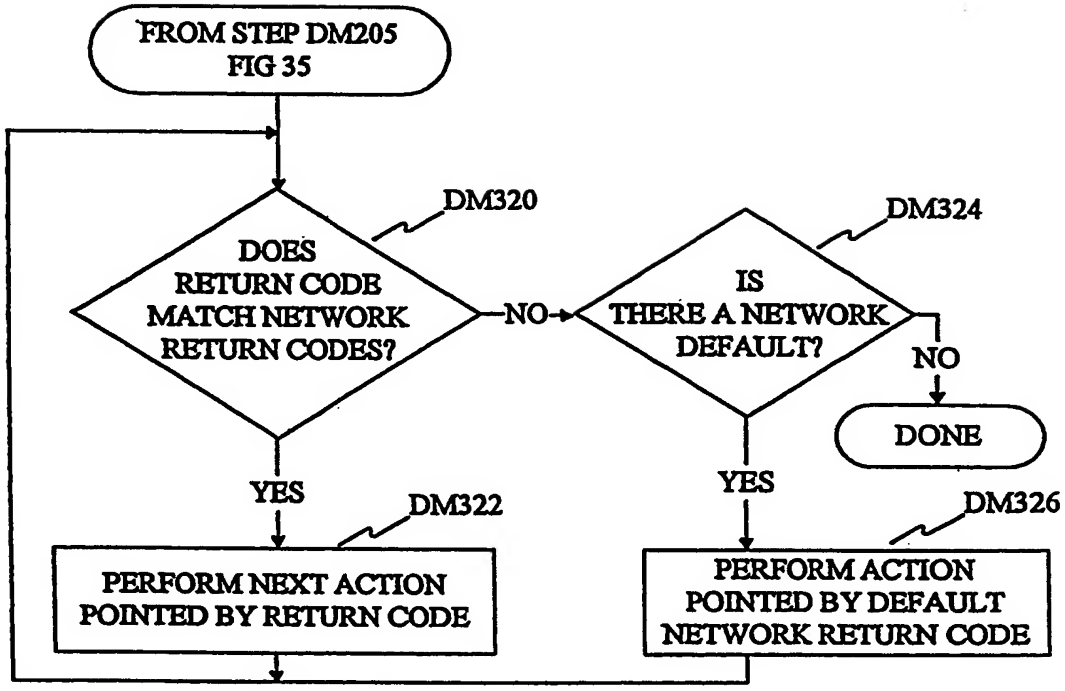

FROM STEP DM205
FIG 35
DM320
DOES
RETURN CODE
MATCH NETWORK
RETURN CODES?
NO
DM324
IS
THERE A NETWORK
DEFAULT?
NO
DONE
YES
DM322
PERFORM NEXT ACTION
POINTED BY RETURN CODE
YES
DM326
PERFORM ACTION
POINTED BY DEFAULT
NETWORK RETURN CODE

FIG 36

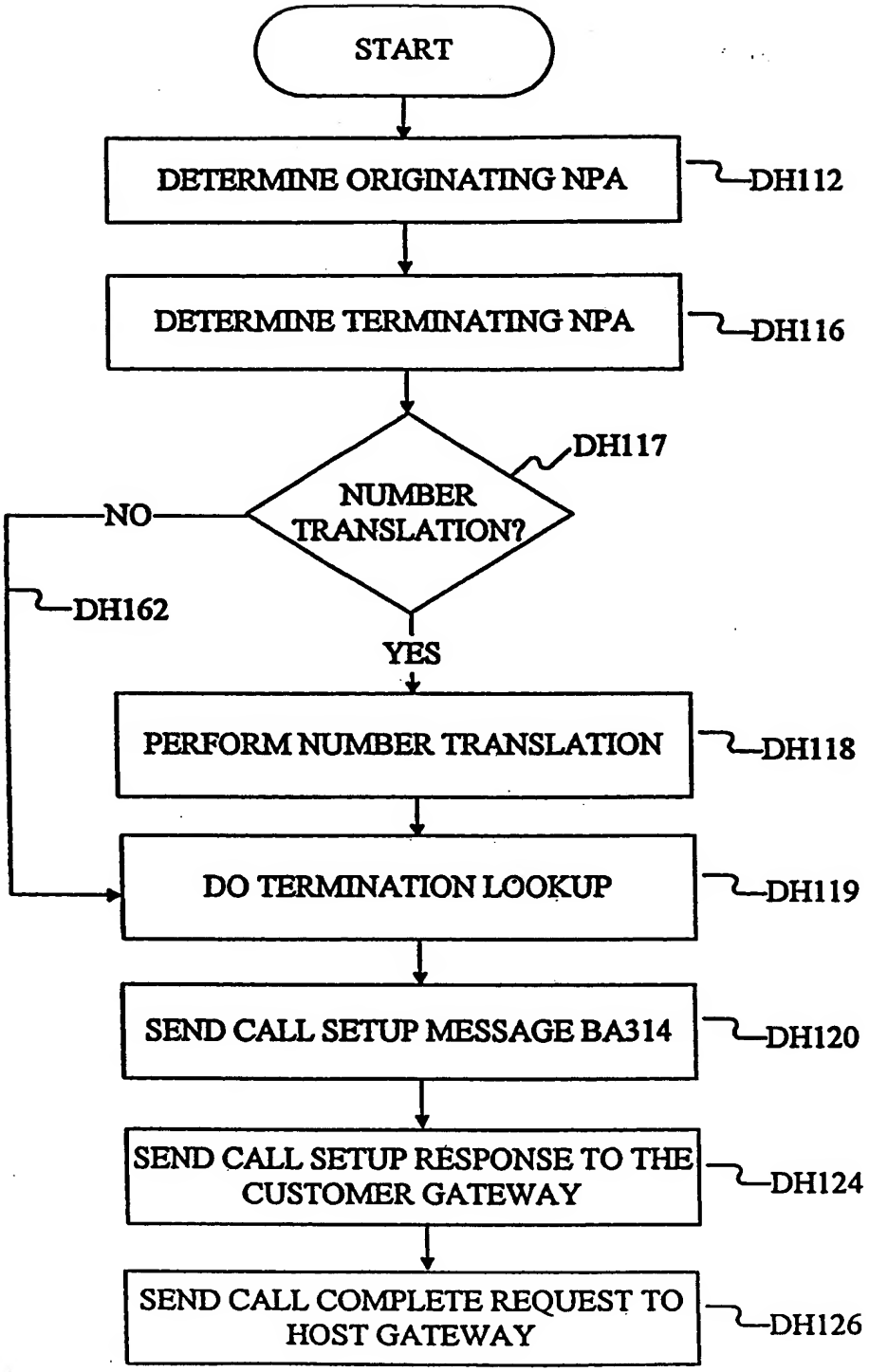

START
DETERMINE ORIGINATING NPA
DH112
DETERMINE TERMINATING NPA
DH116
DH117
NUMBER TRANSLATION?
NO
DH162
YES
PERFORM NUMBER TRANSLATION
DH118
DO TERMINATION LOOKUP
DH119
SEND CALL SETUP MESSAGE BA314
DH120
SEND CALL SETUP RESPONSE TO THE CUSTOMER GATEWAY
DH124
SEND CALL COMPLETE REQUEST TO HOST GATEWAY
DH126

FIG 37

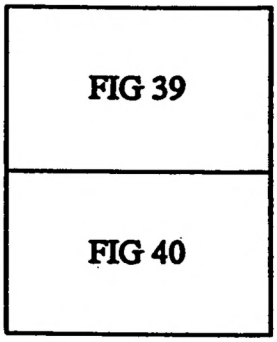


FIG 38

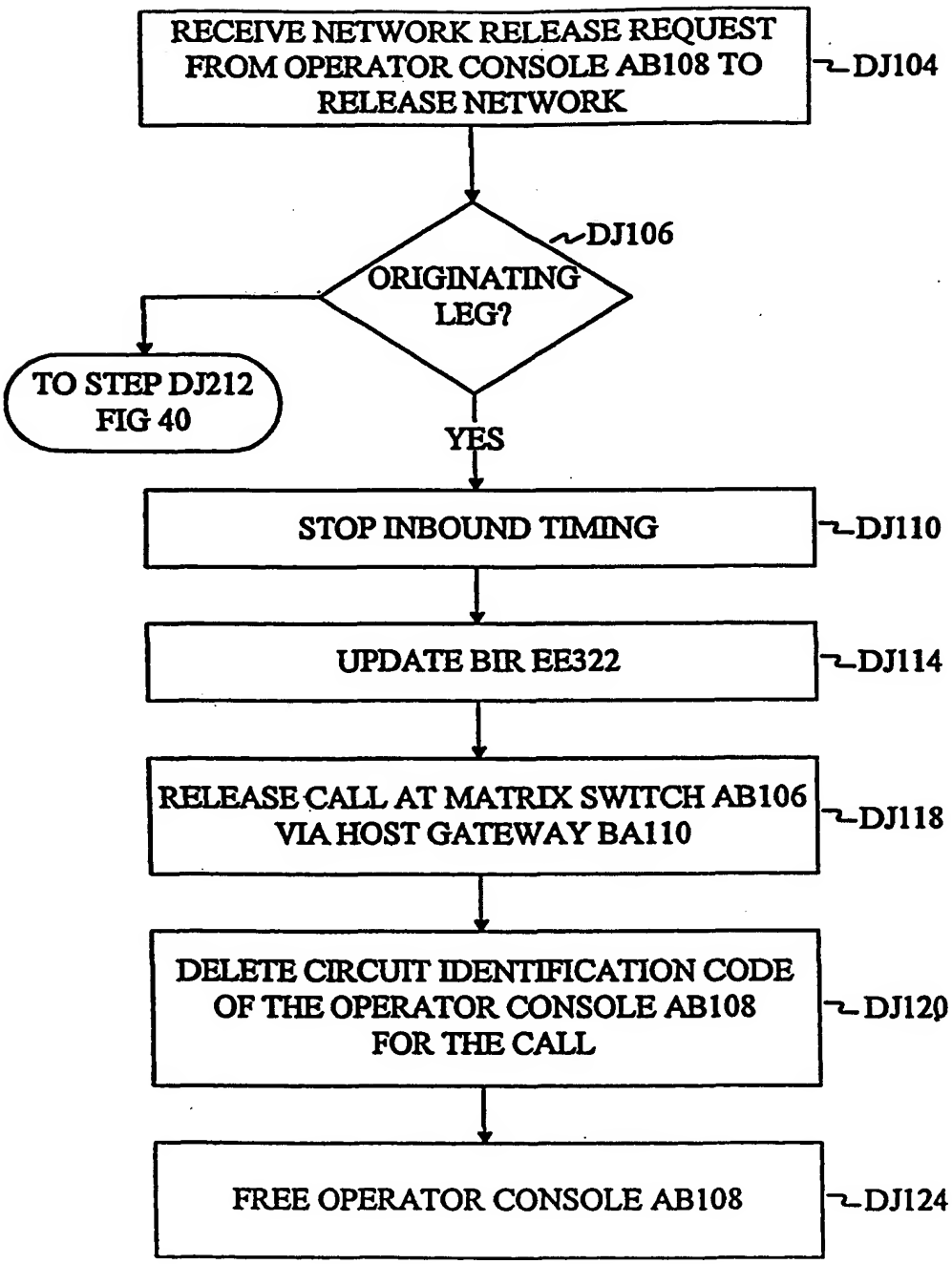

RECEIVE NETWORK RELEASE REQUEST FROM OPERATOR CONSOLE AB108 TO RELEASE NETWORK
DJ104
DJ106
ORIGINATING LEG?
TO STEP DJ212 FIG 40
YES
STOP INBOUND TIMING
DJ110
UPDATE BIR EE322
DJ114
RELEASE CALL AT MATRIX SWITCH AB106 VIA HOST GATEWAY BA110
DJ118
DELETE CIRCUIT IDENTIFICATION CODE OF THE OPERATOR CONSOLE AB108 FOR THE CALL
DJ120
FREE OPERATOR CONSOLE AB108
DJ124

FIG 39

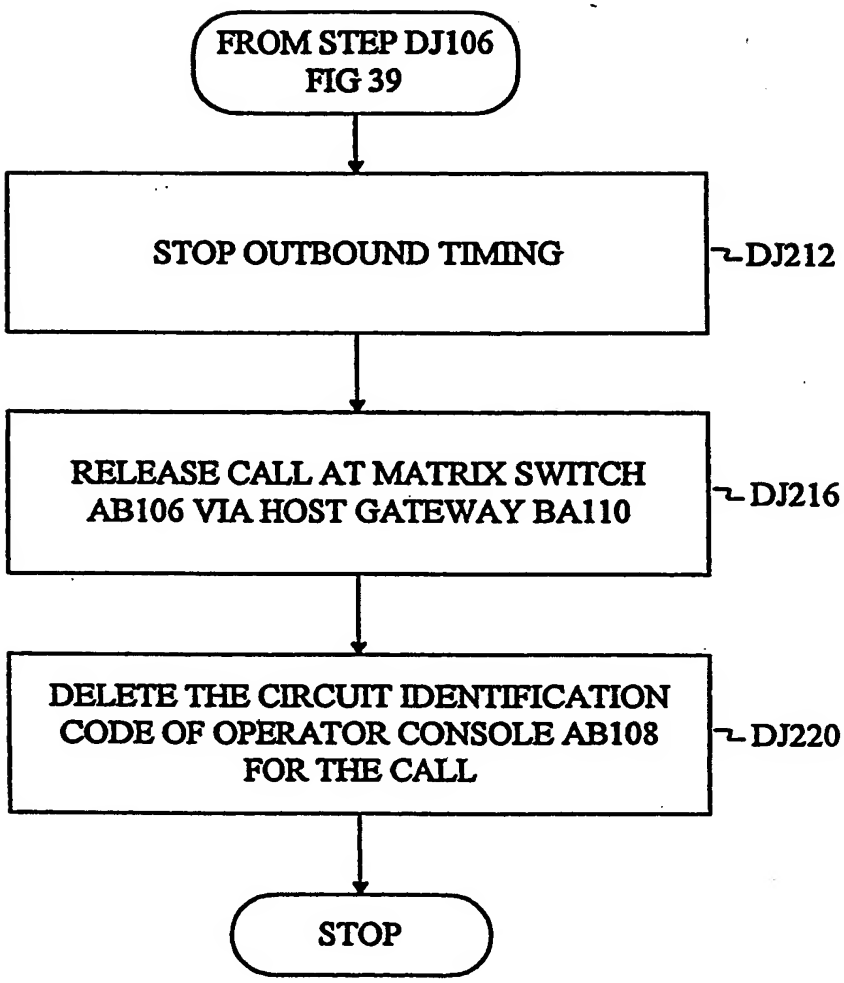

FROM STEP DJ106
FIG 39
STOP OUTBOUND TIMING
DJ212
RELEASE CALL AT MATRIX SWITCH AB106 VIA HOST GATEWAY BA110
DJ216
DELETE THE CIRCUIT IDENTIFICATION CODE OF OPERATOR CONSOLE AB108 FOR THE CALL
DJ220
STOP

FIG 40

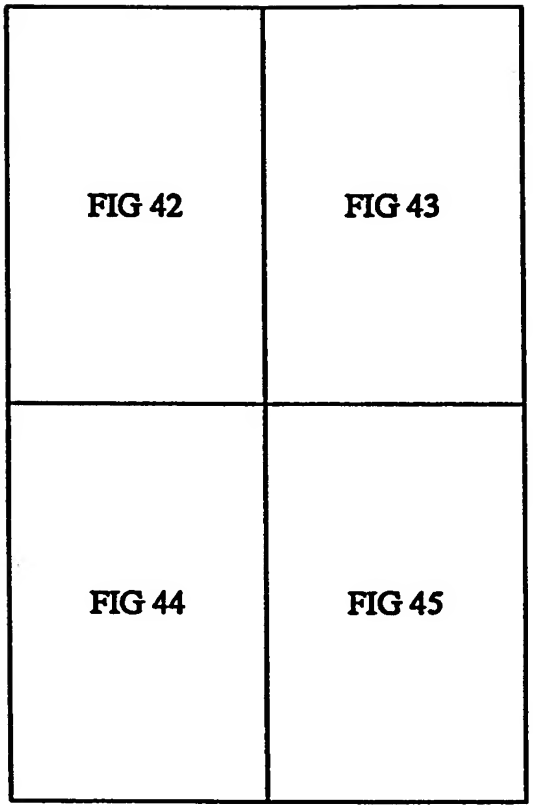


FIG 41

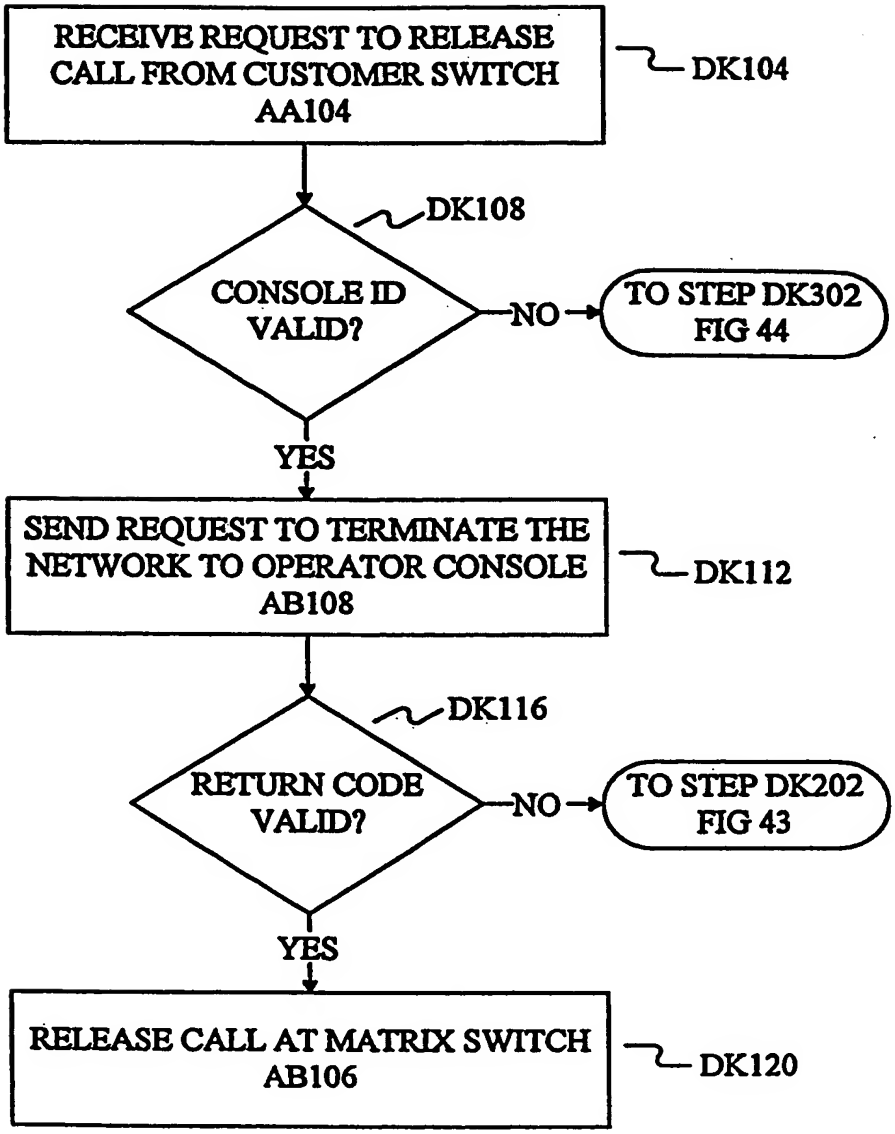

RECEIVE REQUEST TO RELEASE CALL FROM CUSTOMER SWITCH AA104
DK104
DK108
CONSOLE ID VALID?
NO
TO STEP DK302 FIG 44
YES
SEND REQUEST TO TERMINATE THE NETWORK TO OPERATOR CONSOLE AB108
DK112
DK116
RETURN CODE VALID?
NO
TO STEP DK202 FIG 43
YES
RELEASE CALL AT MATRIX SWITCH AB106
DK120

FIG 42

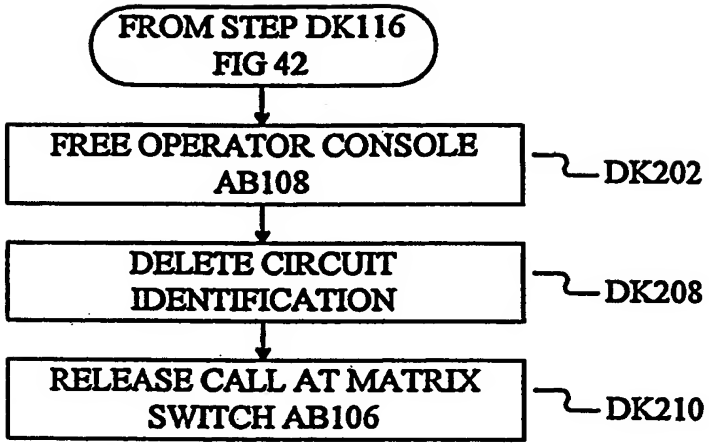

FROM STEP DK116
FIG 42
FREE OPERATOR CONSOLE AB108
DK202
DELETE CIRCUIT IDENTIFICATION
DK208
RELEASE CALL AT MATRIX SWITCH AB106
DK210

FIG 43

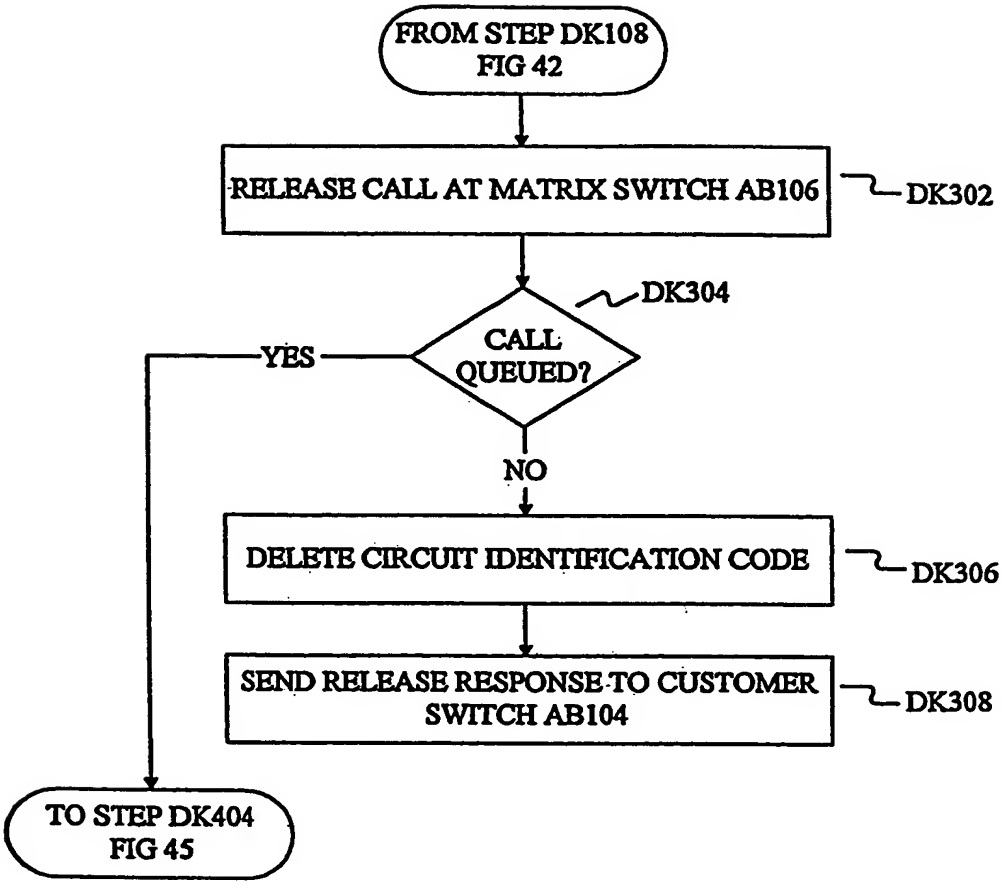

FROM STEP DK108
FIG 42
RELEASE CALL AT MATRIX SWITCH AB106
DK302
DK304
CALL QUEUED?
YES
NO
DELETE CIRCUIT IDENTIFICATION CODE
DK306
SEND RELEASE RESPONSE TO CUSTOMER SWITCH AB104
DK308
TO STEP DK404
FIG 45

FIG 44

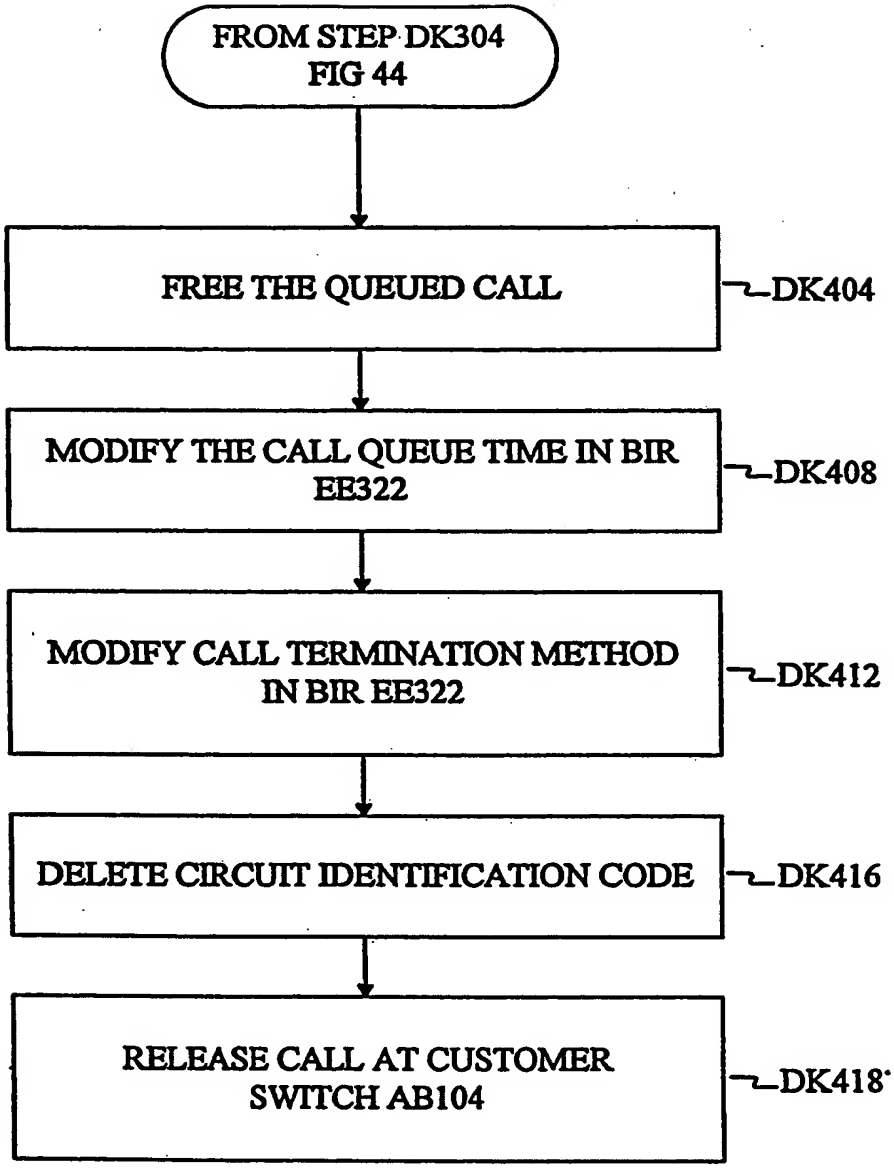

FROM STEP DK304
FIG 44
FREE THE QUEUED CALL
DK404
MODIFY THE CALL QUEUE TIME IN BIR EE322
DK408
MODIFY CALL TERMINATION METHOD IN BIR EE322
DK412
DELETE CIRCUIT IDENTIFICATION CODE
DK416
RELEASE CALL AT CUSTOMER SWITCH AB104
DK418

FIG 45

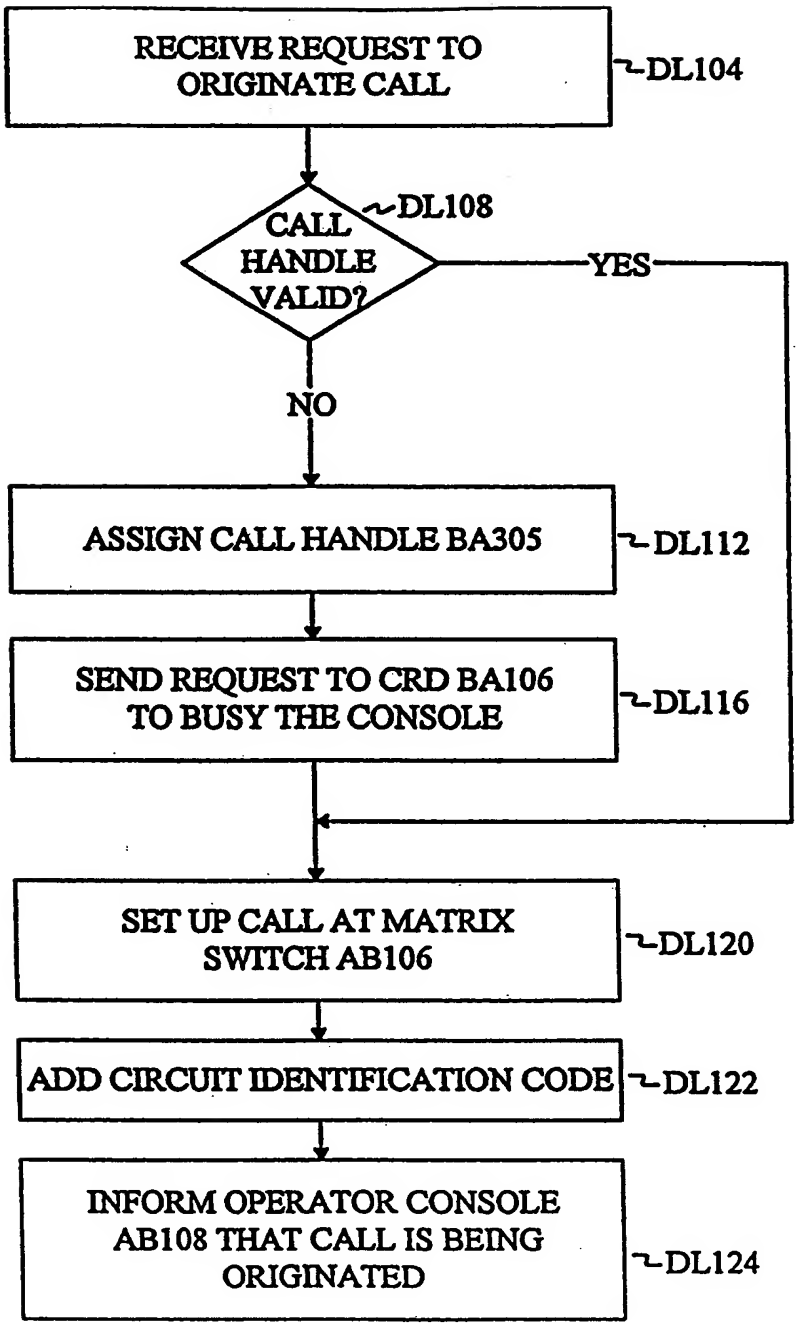

RECEIVE REQUEST TO ORIGINATE CALL
DL104
CALL HANDLE VALID?
DL108
YES
NO
ASSIGN CALL HANDLE BA305
DL112
SEND REQUEST TO CRD BA106 TO BUSY THE CONSOLE
DL116
SET UP CALL AT MATRIX SWITCH AB106
DL120
ADD CIRCUIT IDENTIFICATION CODE
DL122
INFORM OPERATOR CONSOLE AB108 THAT CALL IS BEING ORIGINATED
DL124

FIG 46

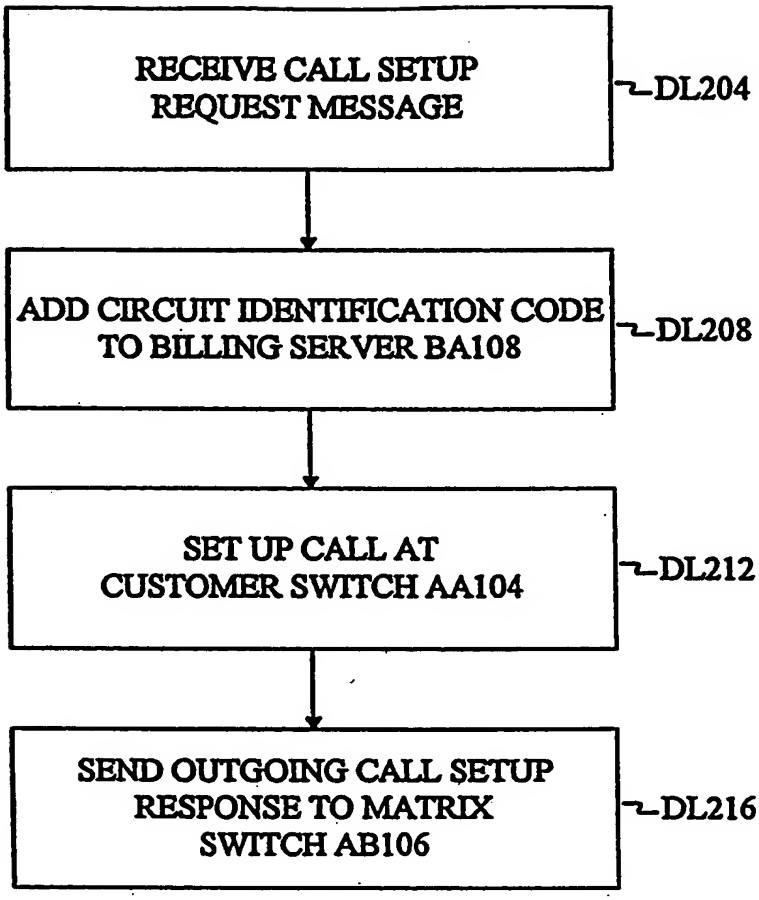

RECEIVE CALL SETUP REQUEST MESSAGE
DL204
ADD CIRCUIT IDENTIFICATION CODE TO BILLING SERVER BA108
DL208
SET UP CALL AT CUSTOMER SWITCH AA104
DL212
SEND OUTGOING CALL SETUP RESPONSE TO MATRIX SWITCH AB106
DL216

FIG 47

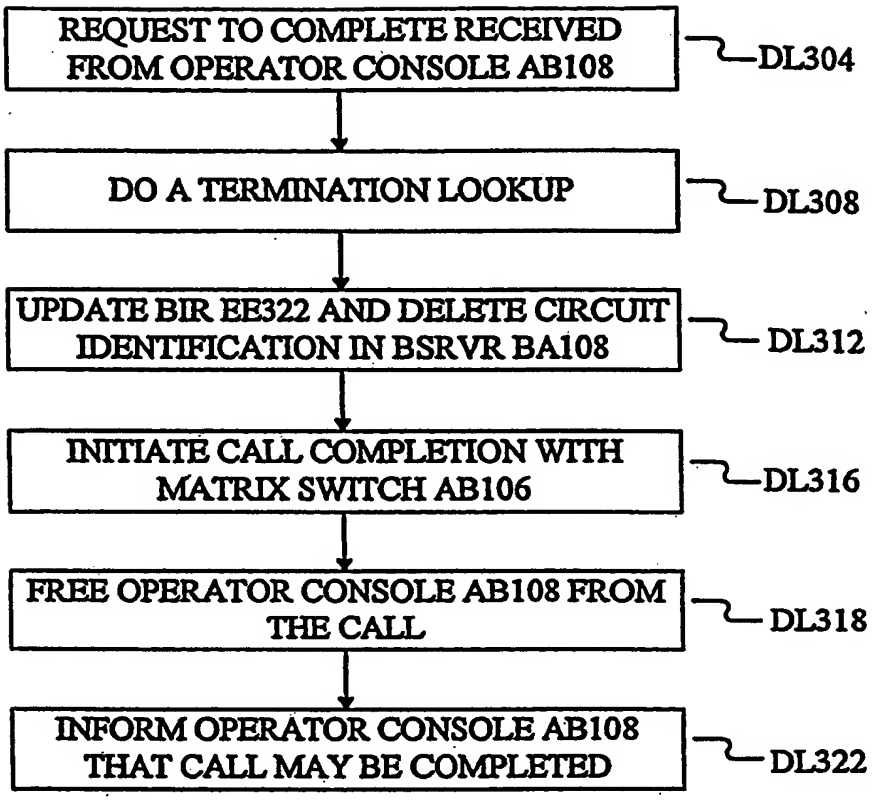

REQUEST TO COMPLETE RECEIVED FROM OPERATOR CONSOLE AB108
DL304
DO A TERMINATION LOOKUP
DL308
UPDATE BIR EE322 AND DELETE CIRCUIT IDENTIFICATION IN BSRVR BA108
DL312
INITIATE CALL COMPLETION WITH MATRIX SWITCH AB106
DL316
FREE OPERATOR CONSOLE AB108 FROM THE CALL
DL318
INFORM OPERATOR CONSOLE AB108 THAT CALL MAY BE COMPLETED
DL322

FIG 48

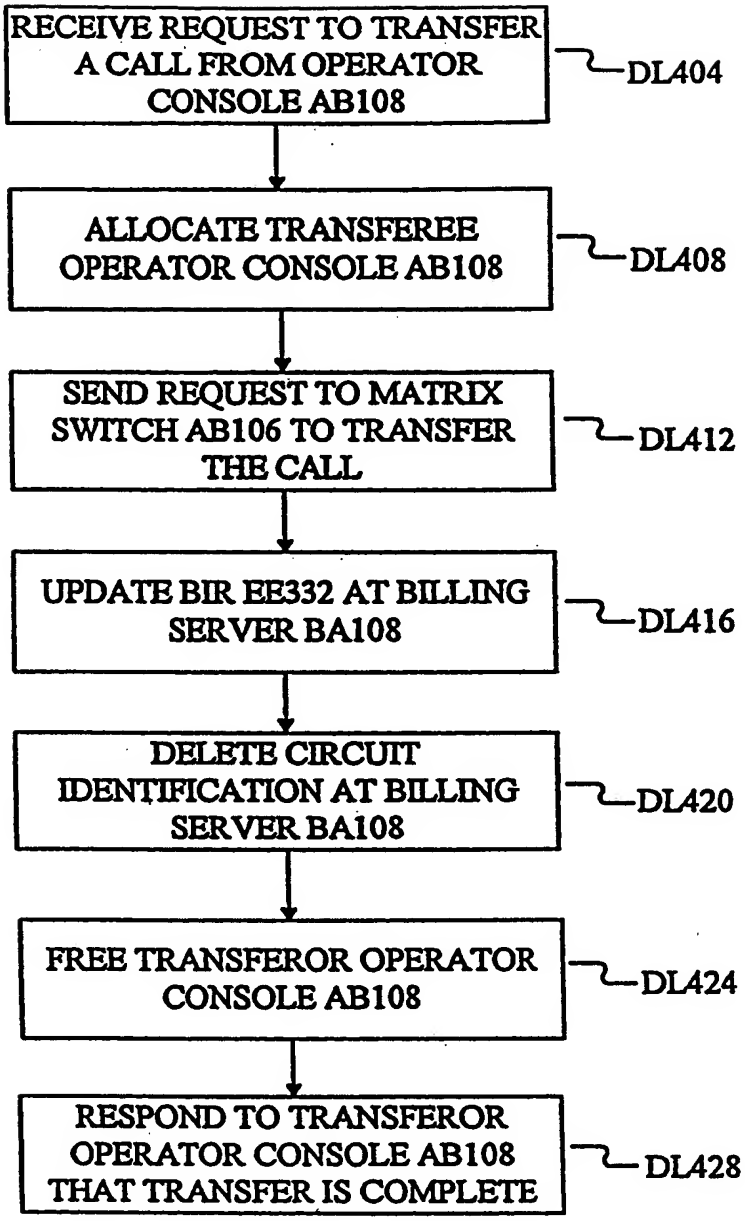

RECEIVE REQUEST TO TRANSFER A CALL FROM OPERATOR CONSOLE AB108
DL404
ALLOCATE TRANSFEREE OPERATOR CONSOLE AB108
DL408
SEND REQUEST TO MATRIX SWITCH AB106 TO TRANSFER THE CALL
DL412
UPDATE BIR EE332 AT BILLING SERVER BA108
DL416
DELETE CIRCUIT IDENTIFICATION AT BILLING SERVER BA108
DL420
FREE TRANSFEROR OPERATOR CONSOLE AB108
DL424
RESPOND TO TRANSFEROR OPERATOR CONSOLE AB108 THAT TRANSFER IS COMPLETE
DL428

FIG 49

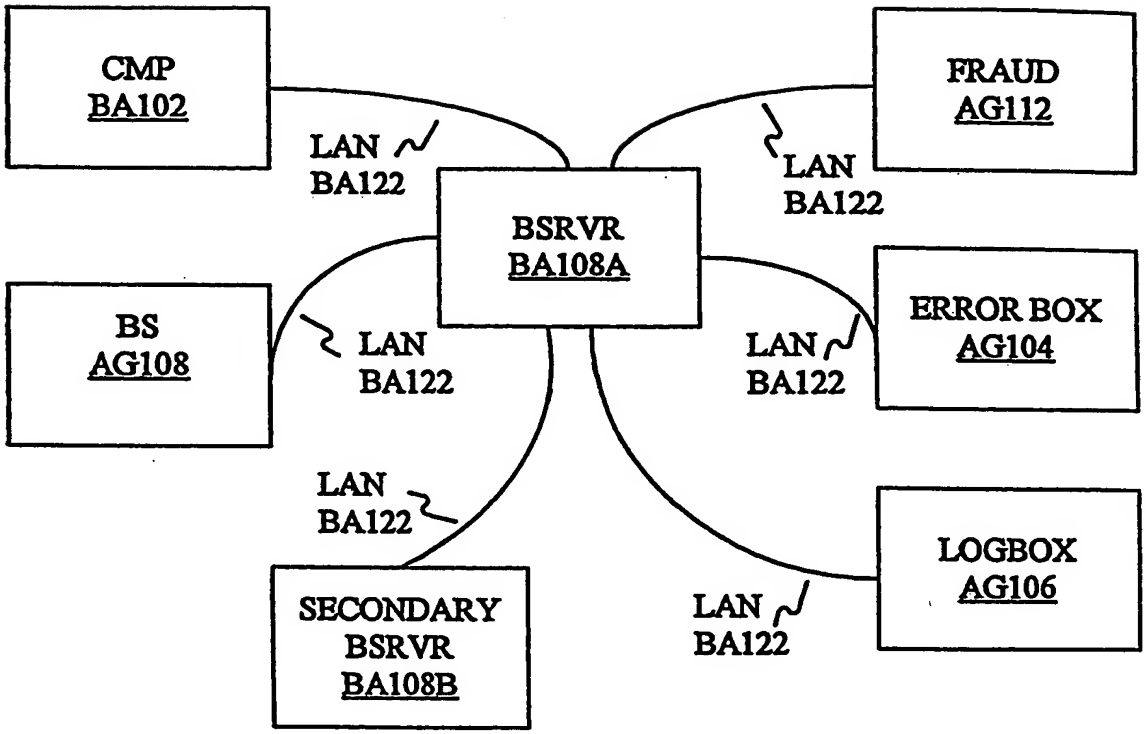

CMP
BA102
LAN
BA122
FRAUD
AG112
LAN
BA122
BSRVR
BA108A
BS
AG108
LAN
BA122
ERROR BOX
AG104
LAN
BA122
LAN
BA122
LOGBOX
AG106
SECONDARY
BSRVR
BA108B
LAN
BA122

FIG 50

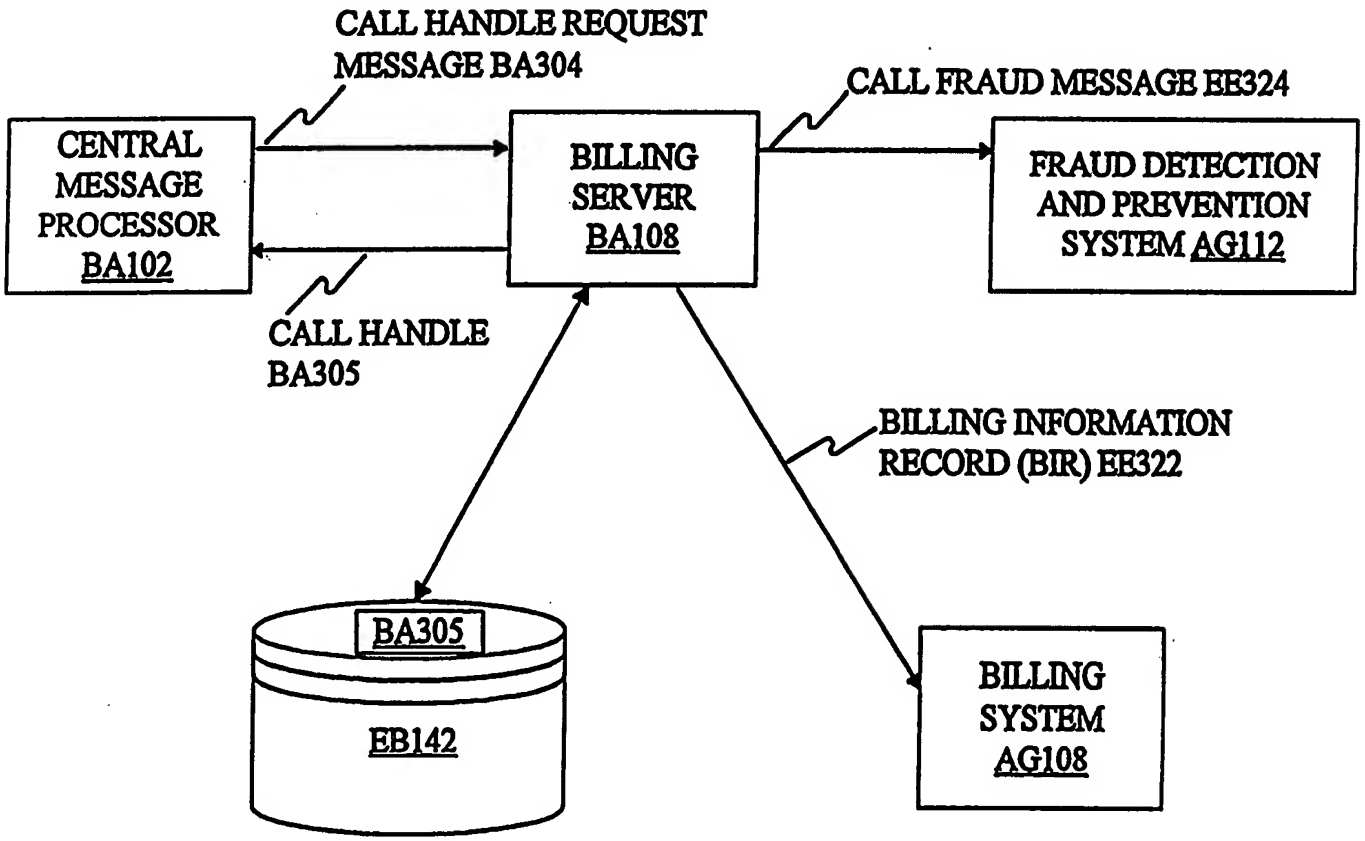

CALL HANDLE REQUEST MESSAGE BA304
CALL FRAUD MESSAGE EE324
CENTRAL MESSAGE PROCESSOR BA102
BILLING SERVER BA108
FRAUD DETECTION AND PREVENTION SYSTEM AG112
CALL HANDLE BA305
BILLING INFORMATION RECORD (BIR) EE322
BA305
EB142
BILLING SYSTEM AG108

FIG 51

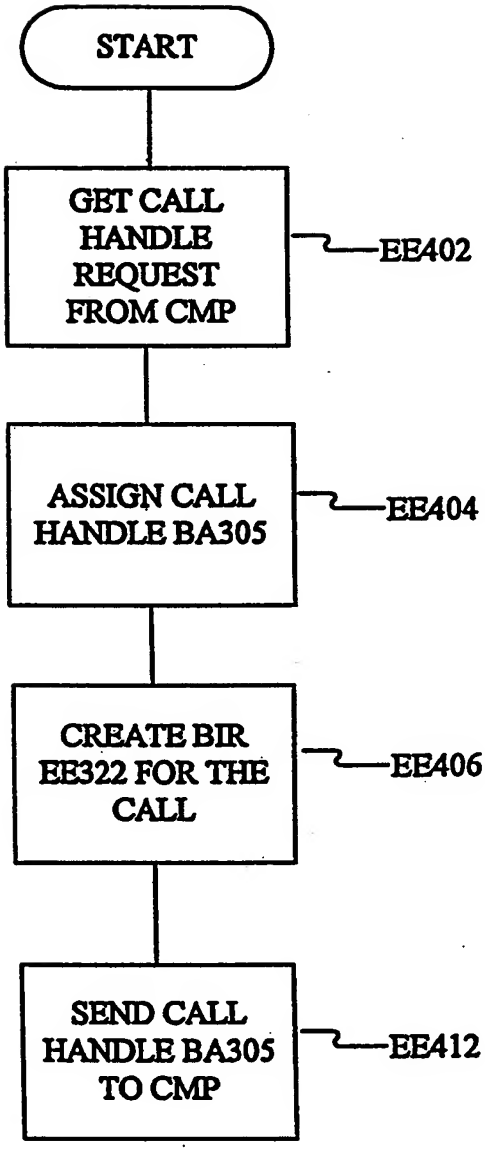

START
GET CALL HANDLE REQUEST FROM CMP
EE402
ASSIGN CALL HANDLE BA305
EE404
CREATE BIR EE322 FOR THE CALL
EE406
SEND CALL HANDLE BA305 TO CMP
EE412

FIG 52

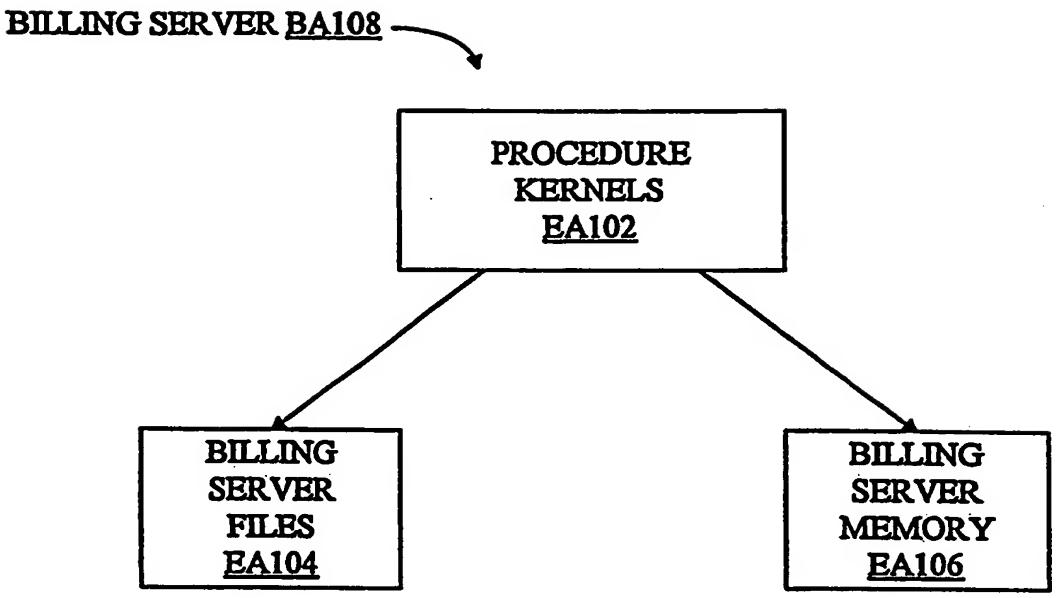

BILLING SERVER BA108
PROCEDURE KERNELS EA102
BILLING SERVER FILES EA104
BILLING SERVER MEMORY EA106

FIG 53

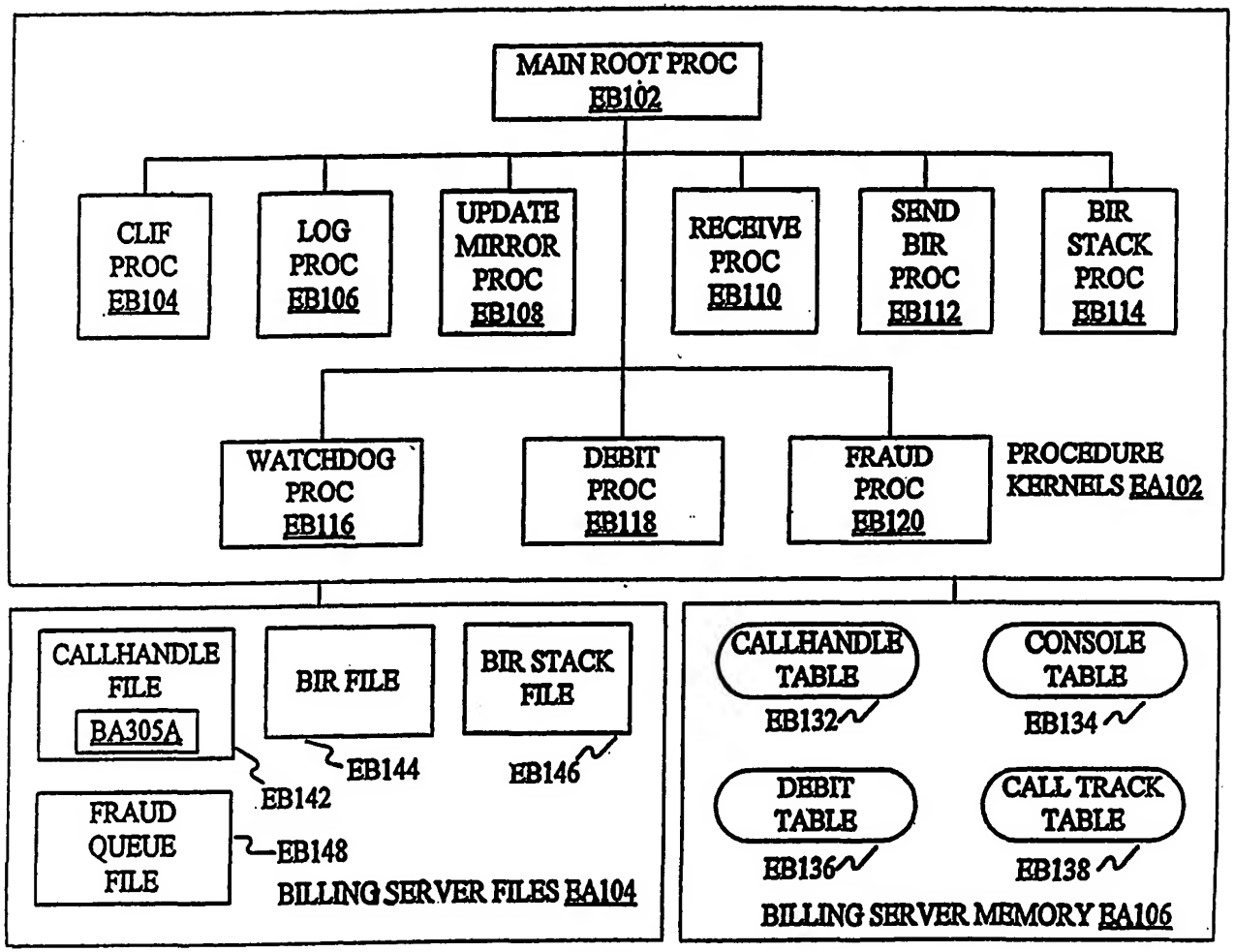

MAIN ROOT PROC EB102
CLIF PROC EB104
LOG PROC EB106
UPDATE MIRROR PROC EB108
RECEIVE PROC EB110
SEND BIR PROC EB112
BIR STACK PROC EB114
WATCHDOG PROC EB116
DEBIT PROC EB118
FRAUD PROC EB120
PROCEDURE KERNELS EA102
CALLHANDLE FILE
BA305A
EB142
BIR FILE
EB144
BIR STACK FILE
EB146
FRAUD QUEUE FILE
EB148
BILLING SERVER FILES EA104
CALLHANDLE TABLE
EB132
CONSOLE TABLE
EB134
DEBIT TABLE
EB136
CALL TRACK TABLE
EB138
BILLING SERVER MEMORY EA106

FIG 54

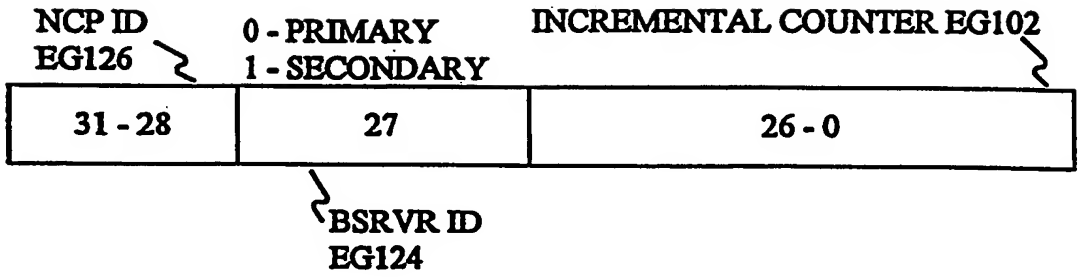

NCP ID
EG126
0 - PRIMARY
1 - SECONDARY
INCREMENTAL COUNTER EG102
31 - 28
27
26 - 0
BSRVR ID
EG124

FIG 55

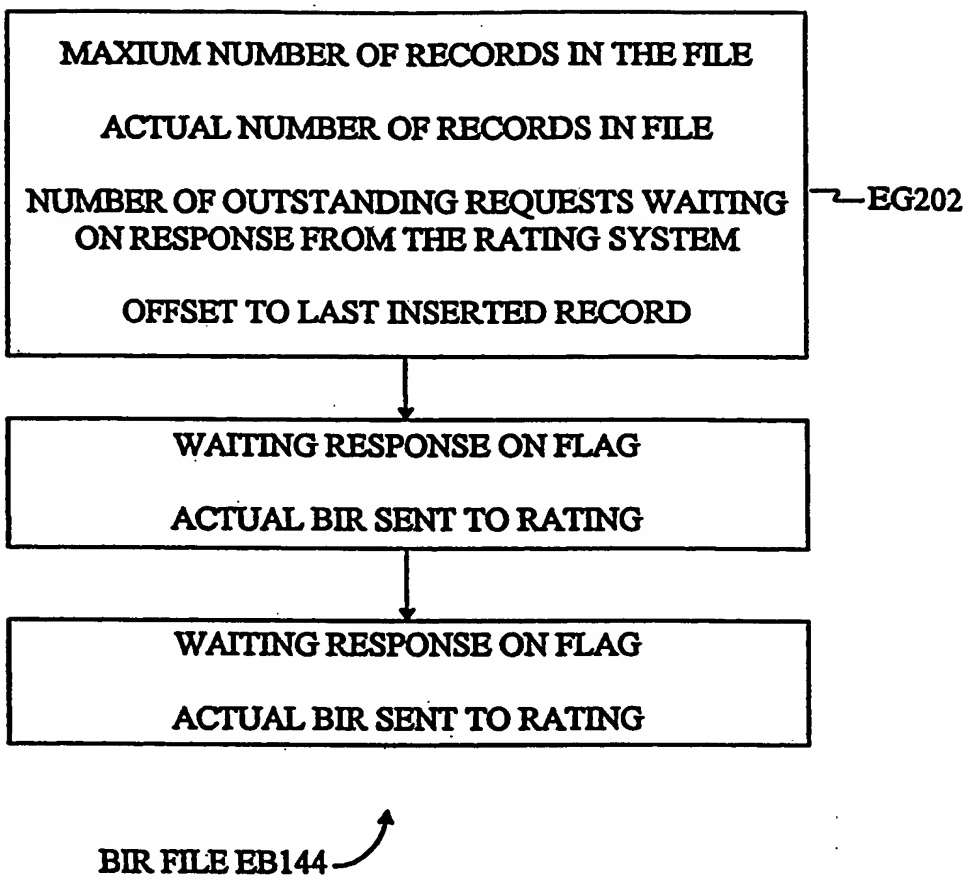

MAXIUM NUMBER OF RECORDS IN THE FILE
ACTUAL NUMBER OF RECORDS IN FILE
NUMBER OF OUTSTANDING REQUESTS WAITING ON RESPONSE FROM THE RATING SYSTEM
OFFSET TO LAST INSERTED RECORD
EG202
WAITING RESPONSE ON FLAG
ACTUAL BIR SENT TO RATING
WAITING RESPONSE ON FLAG
ACTUAL BIR SENT TO RATING
BIR FILE EB144

FIG 56

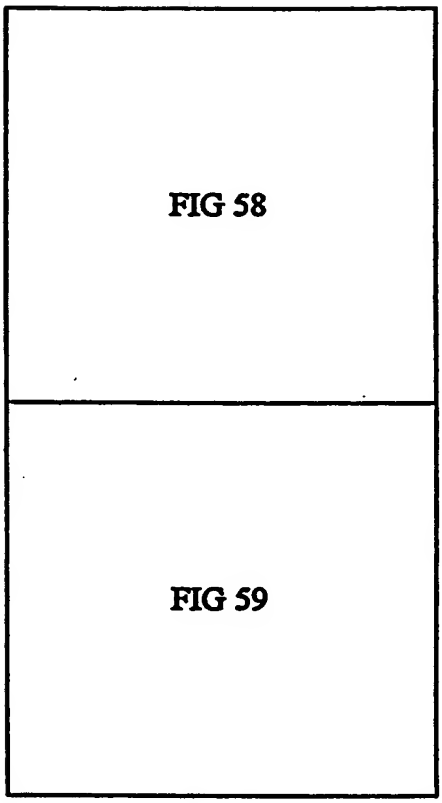


FIG 57

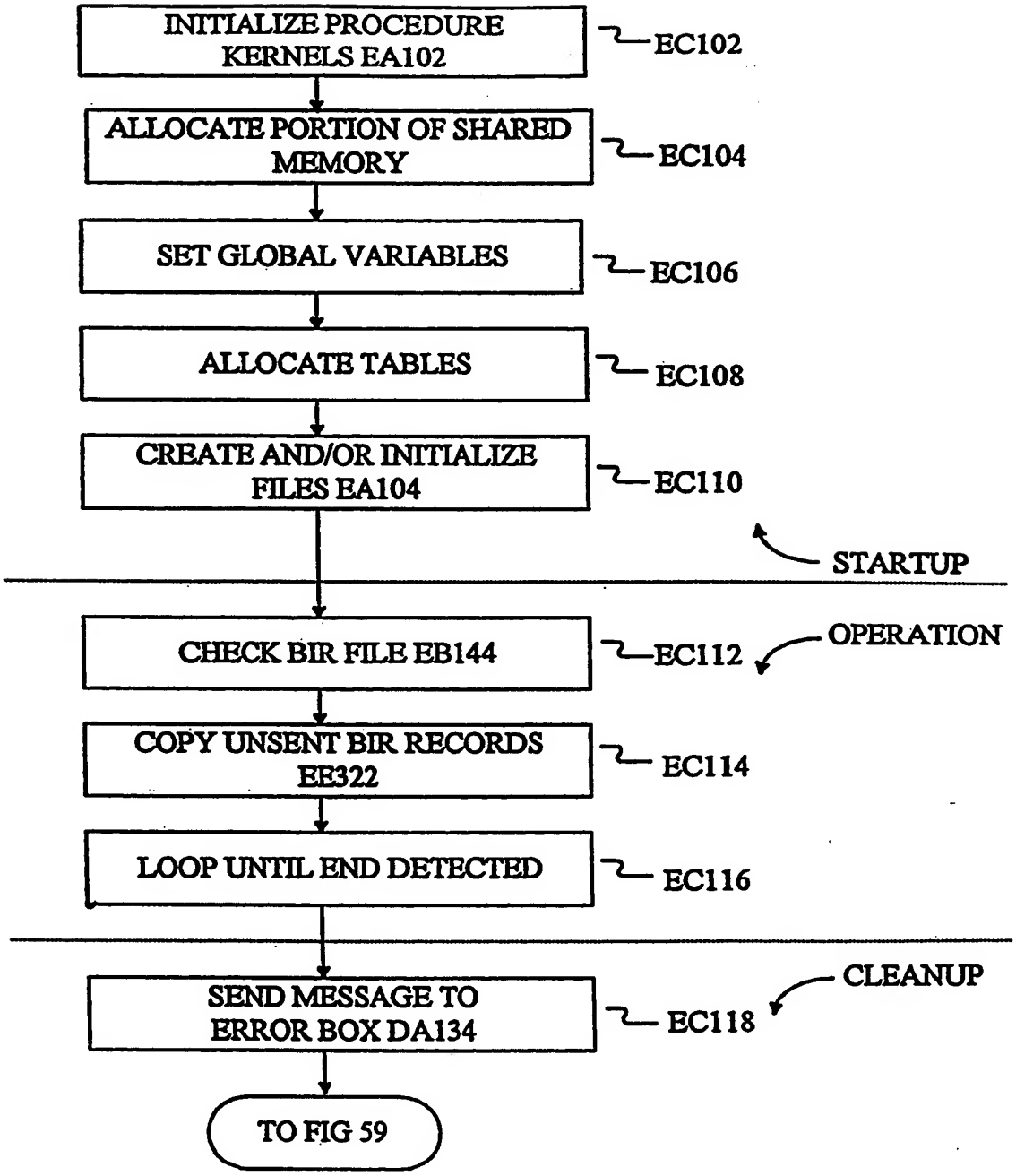

INITIALIZE PROCEDURE KERNELS EA102
EC102
ALLOCATE PORTION OF SHARED MEMORY
EC104
SET GLOBAL VARIABLES
EC106
ALLOCATE TABLES
EC108
CREATE AND/OR INITIALIZE FILES EA104
EC110
STARTUP
CHECK BIR FILE EB144
EC112
OPERATION
COPY UNSENT BIR RECORDS EE322
EC114
LOOP UNTIL END DETECTED
EC116
SEND MESSAGE TO ERROR BOX DA134
EC118
CLEANUP
TO FIG 59

FIG 58

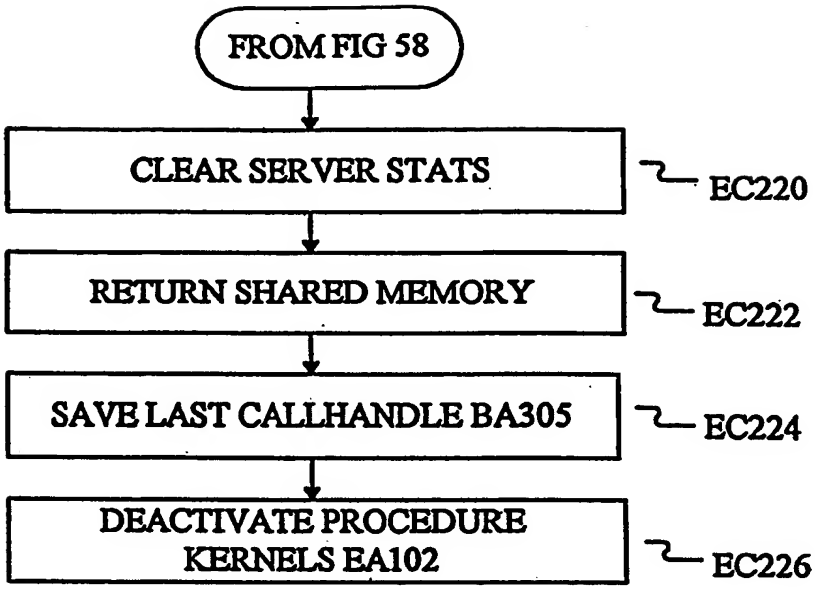

FROM FIG 58
CLEAR SERVER STATS
EC220
RETURN SHARED MEMORY
EC222
SAVE LAST CALLHANDLE BA305
EC224
DEACTIVATE PROCEDURE KERNELS EA102
EC226

FIG 59

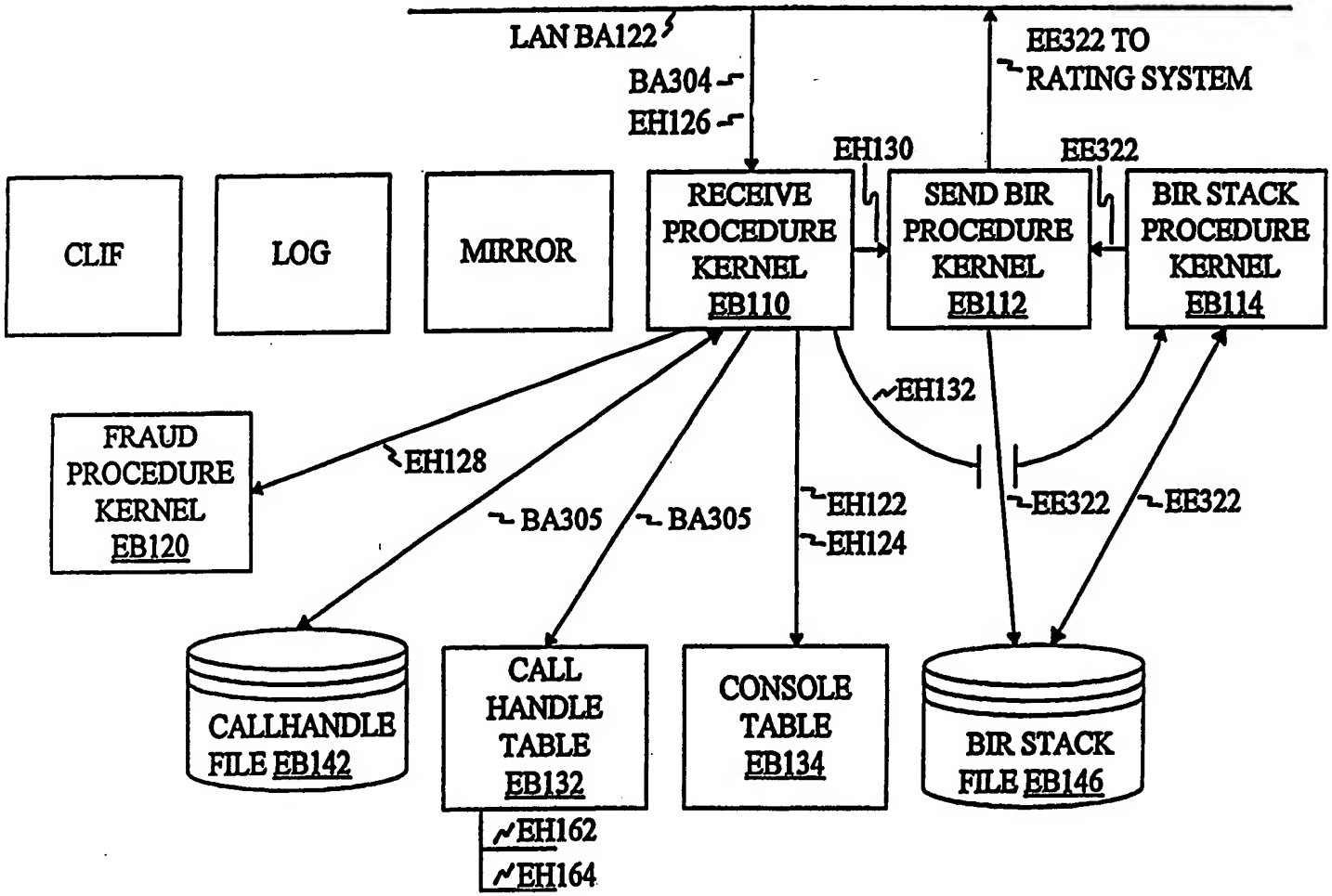

LAN BA122
BA304
EH126
EE322 TO
RATING SYSTEM
EH130
EE322
CLIF
LOG
MIRROR
RECEIVE
PROCEDURE
KERNEL
EB110
SEND BIR
PROCEDURE
KERNEL
EB112
BIR STACK
PROCEDURE
KERNEL
EB114
EH132
FRAUD
PROCEDURE
KERNEL
EB120
EH128
BA305
BA305
EH122
EH124
EE322
EE322
CALLHANDLE
FILE EB142
CALL
HANDLE
TABLE
EB132
CONSOLE
TABLE
EB134
BIR STACK
FILE EB146
EH162
EH164

FIG 60

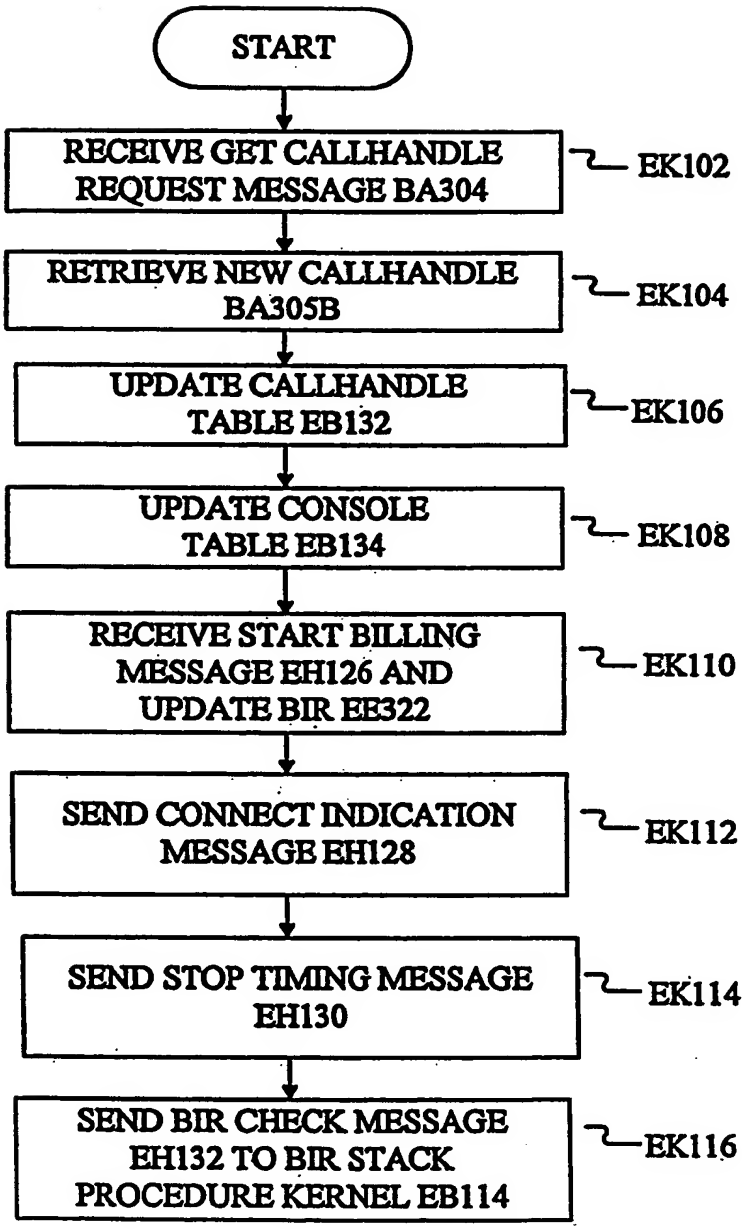

START
RECEIVE GET CALLHANDLE REQUEST MESSAGE BA304
EK102
RETRIEVE NEW CALLHANDLE BA305B
EK104
UPDATE CALLHANDLE TABLE EB132
EK106
UPDATE CONSOLE TABLE EB134
EK108
RECEIVE START BILLING MESSAGE EH126 AND UPDATE BIR EE322
EK110
SEND CONNECT INDICATION MESSAGE EH128
EK112
SEND STOP TIMING MESSAGE EH130
EK114
SEND BIR CHECK MESSAGE EH132 TO BIR STACK PROCEDURE KERNEL EB114
EK116

FIG 61

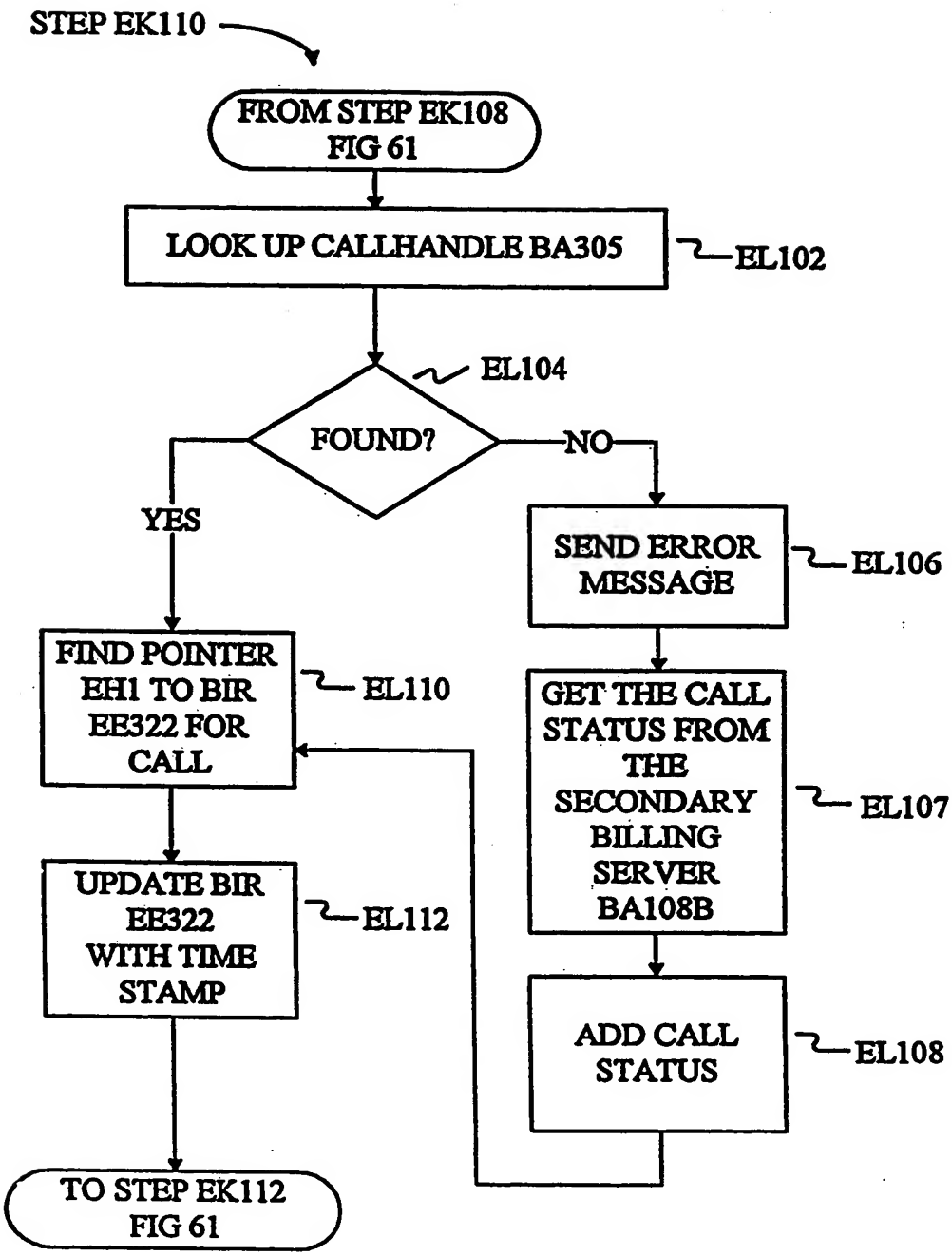

STEP EK110
FROM STEP EK108 FIG 61
LOOK UP CALLHANDLE BA305
EL102
EL104
FOUND?
NO
YES
SEND ERROR MESSAGE
EL106
FIND POINTER EH1 TO BIR EE322 FOR CALL
EL110
GET THE CALL STATUS FROM THE SECONDARY BILLING SERVER BA108B
EL107
UPDATE BIR EE322 WITH TIME STAMP
EL112
ADD CALL STATUS
EL108
TO STEP EK112 FIG 61

FIG 62

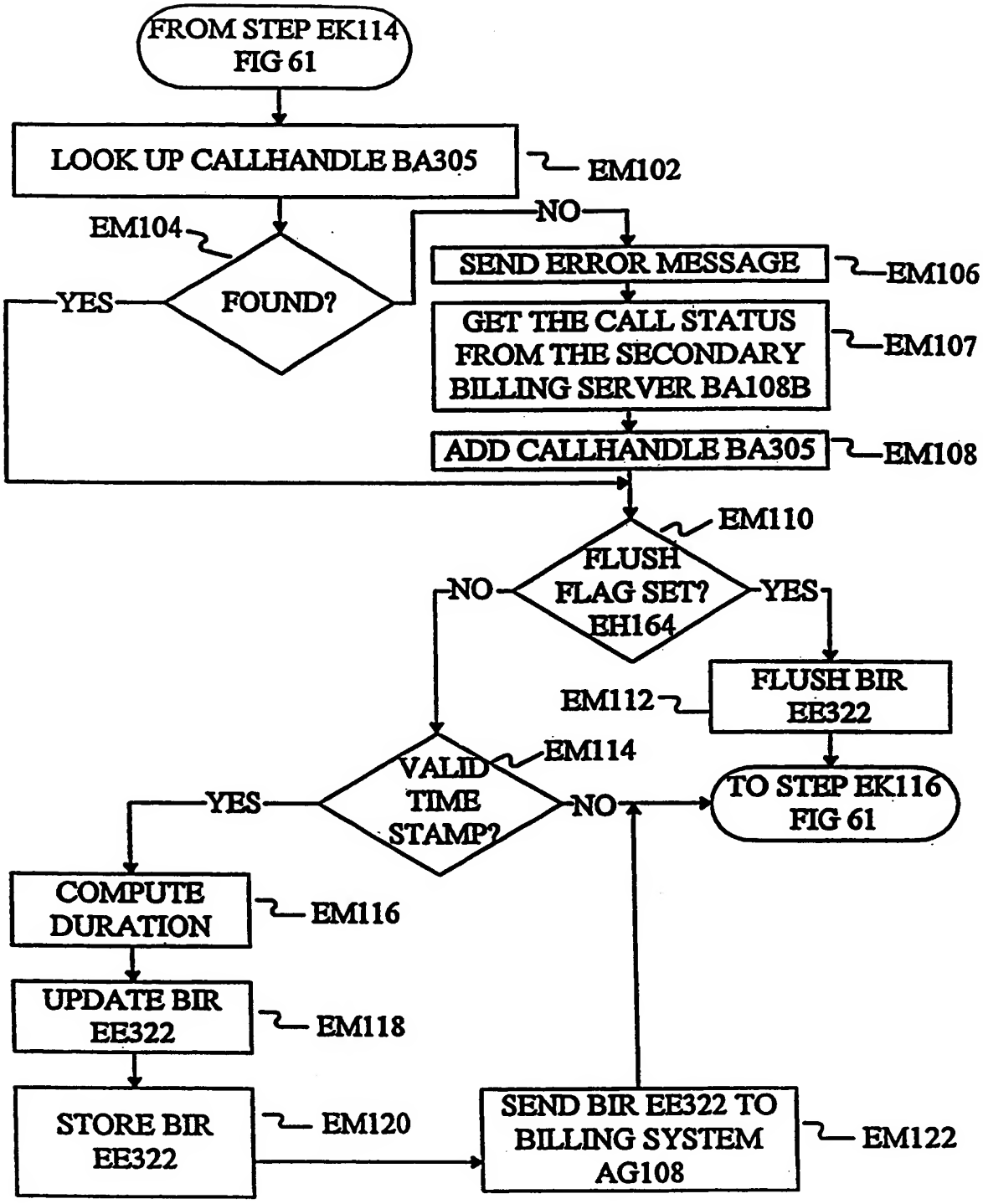

FROM STEP EK114
FIG 61
LOOK UP CALLHANDLE BA305
EM102
EM104
FOUND?
YES
NO
SEND ERROR MESSAGE
EM106
GET THE CALL STATUS FROM THE SECONDARY BILLING SERVER BA108B
EM107
ADD CALLHANDLE BA305
EM108
EM110
FLUSH FLAG SET? EH164
NO
YES
EM112
FLUSH BIR EE322
EM114
VALID TIME STAMP?
YES
NO
TO STEP EK116 FIG 61
COMPUTE DURATION
EM116
UPDATE BIR EE322
EM118
STORE BIR EE322
EM120
SEND BIR EE322 TO BILLING SYSTEM AG108
EM122

FIG 63

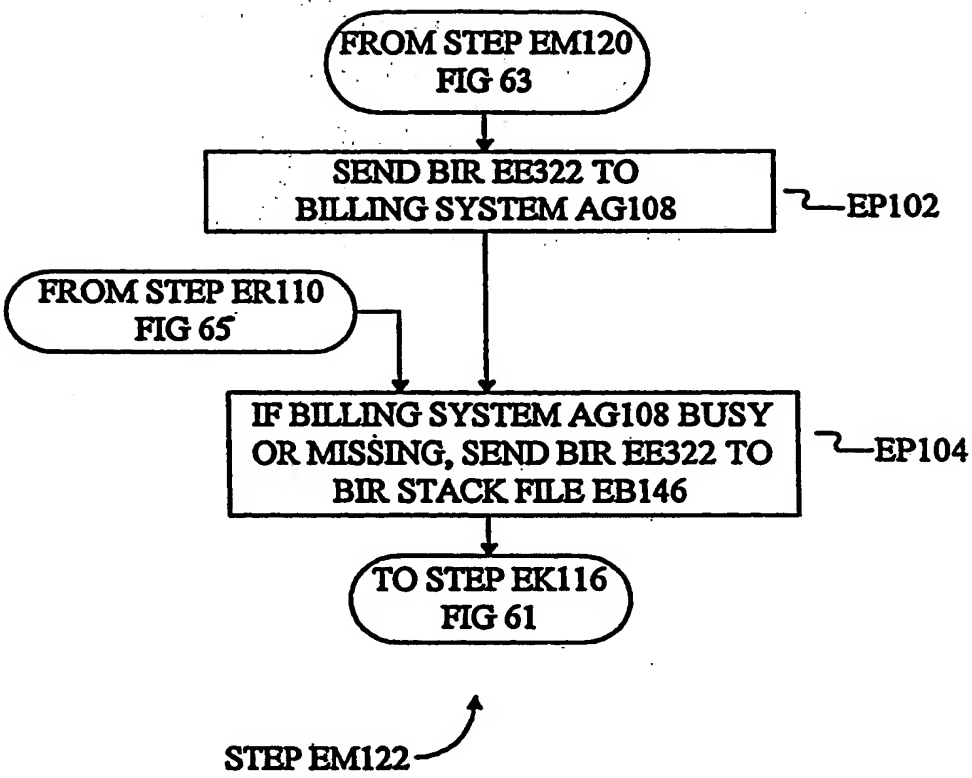

FROM STEP EM120
FIG 63
SEND BIR EE322 TO
BILLING SYSTEM AG108
EP102
FROM STEP ER110
FIG 65
IF BILLING SYSTEM AG108 BUSY
OR MISSING, SEND BIR EE322 TO
BIR STACK FILE EB146
EP104
TO STEP EK116
FIG 61
STEP EM122

FIG 64

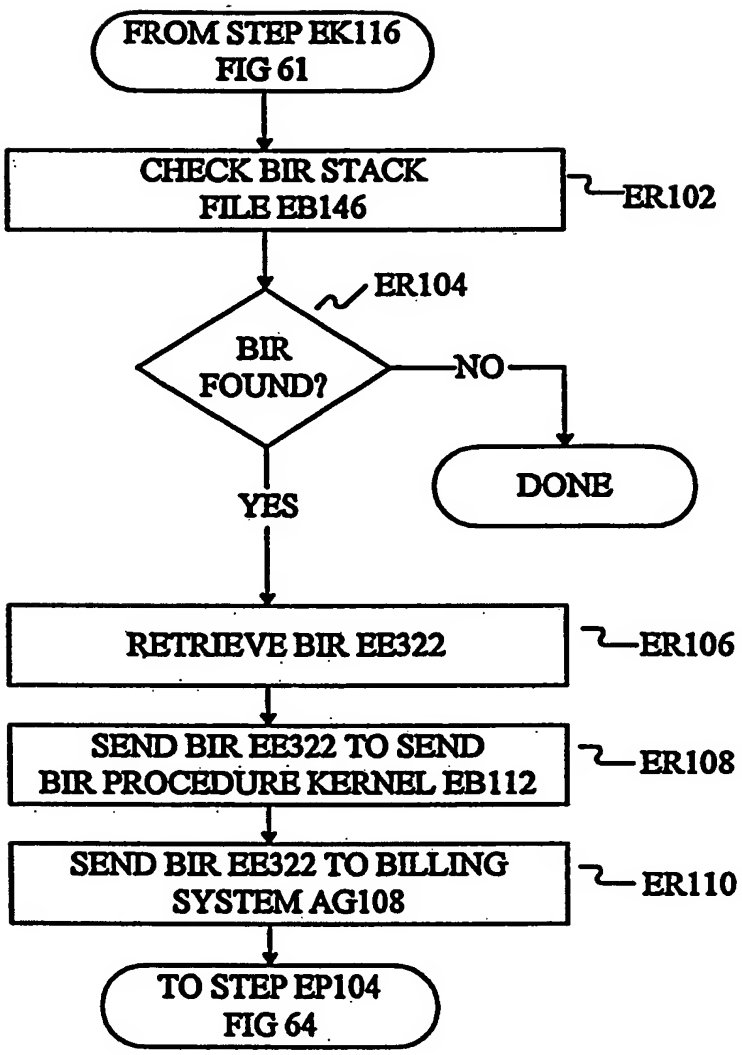

FROM STEP EK116
FIG 61
CHECK BIR STACK
FILE EB146
ER102
ER104
BIR
FOUND?
NO
DONE
YES
RETRIEVE BIR EE322
ER106
SEND BIR EE322 TO SEND
BIR PROCEDURE KERNEL EB112
ER108
SEND BIR EE322 TO BILLING
SYSTEM AG108
ER110
TO STEP EP104
FIG 64

FIG 65

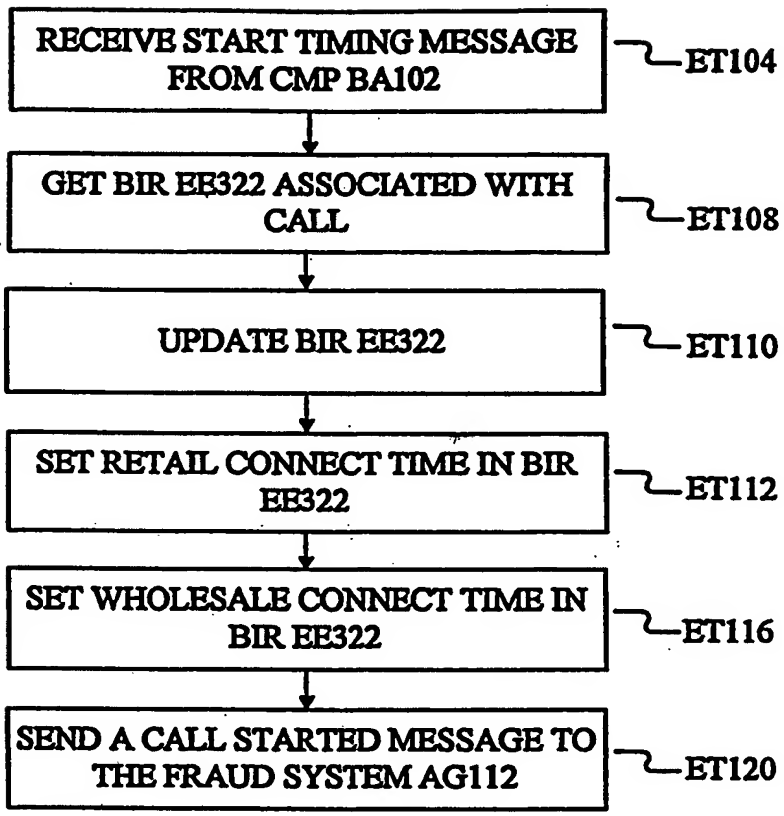

RECEIVE START TIMING MESSAGE FROM CMP BA102
ET104
GET BIR EE322 ASSOCIATED WITH CALL
ET108
UPDATE BIR EE322
ET110
SET RETAIL CONNECT TIME IN BIR EE322
ET112
SET WHOLESALE CONNECT TIME IN BIR EE322
ET116
SEND A CALL STARTED MESSAGE TO THE FRAUD SYSTEM AG112
ET120

FIG 66

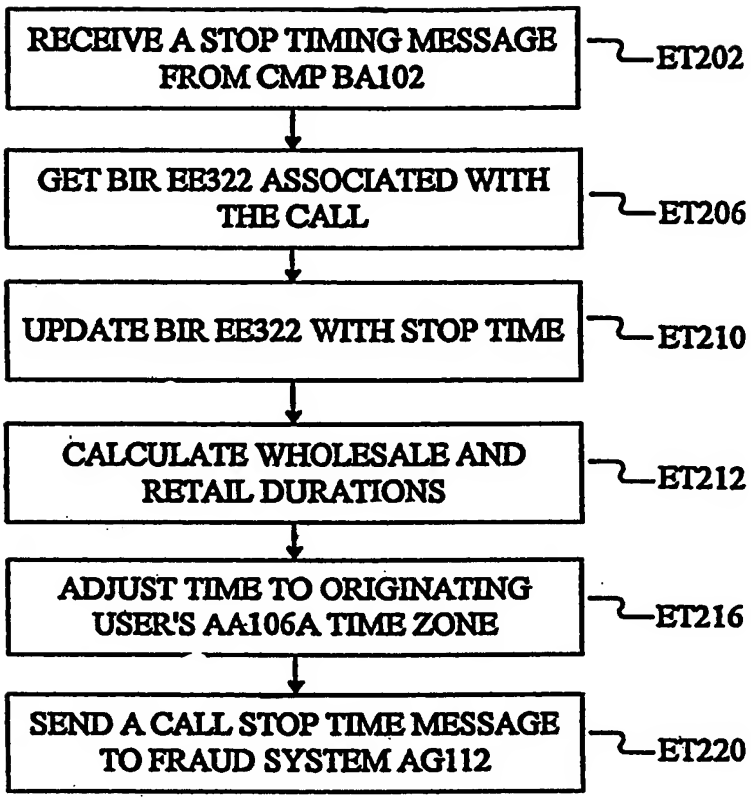

RECEIVE A STOP TIMING MESSAGE FROM CMP BA102
ET202
GET BIR EE322 ASSOCIATED WITH THE CALL
ET206
UPDATE BIR EE322 WITH STOP TIME
ET210
CALCULATE WHOLESALE AND RETAIL DURATIONS
ET212
ADJUST TIME TO ORIGINATING USER'S AA106A TIME ZONE
ET216
SEND A CALL STOP TIME MESSAGE TO FRAUD SYSTEM AG112
ET220

FIG 67

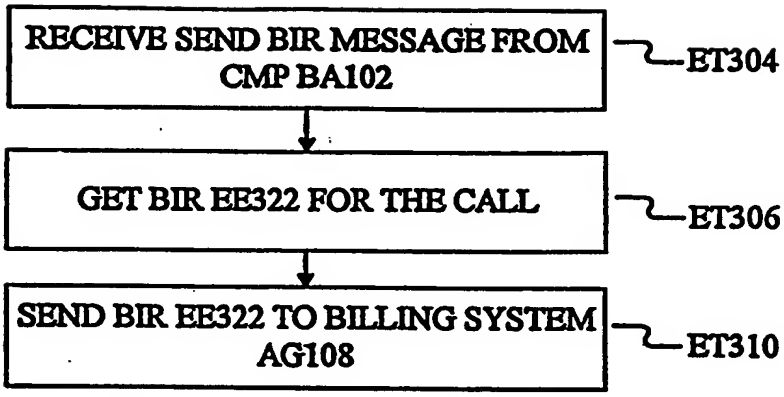

RECEIVE SEND BIR MESSAGE FROM CMP BA102
ET304
GET BIR EE322 FOR THE CALL
ET306
SEND BIR EE322 TO BILLING SYSTEM AG108
ET310

FIG 68

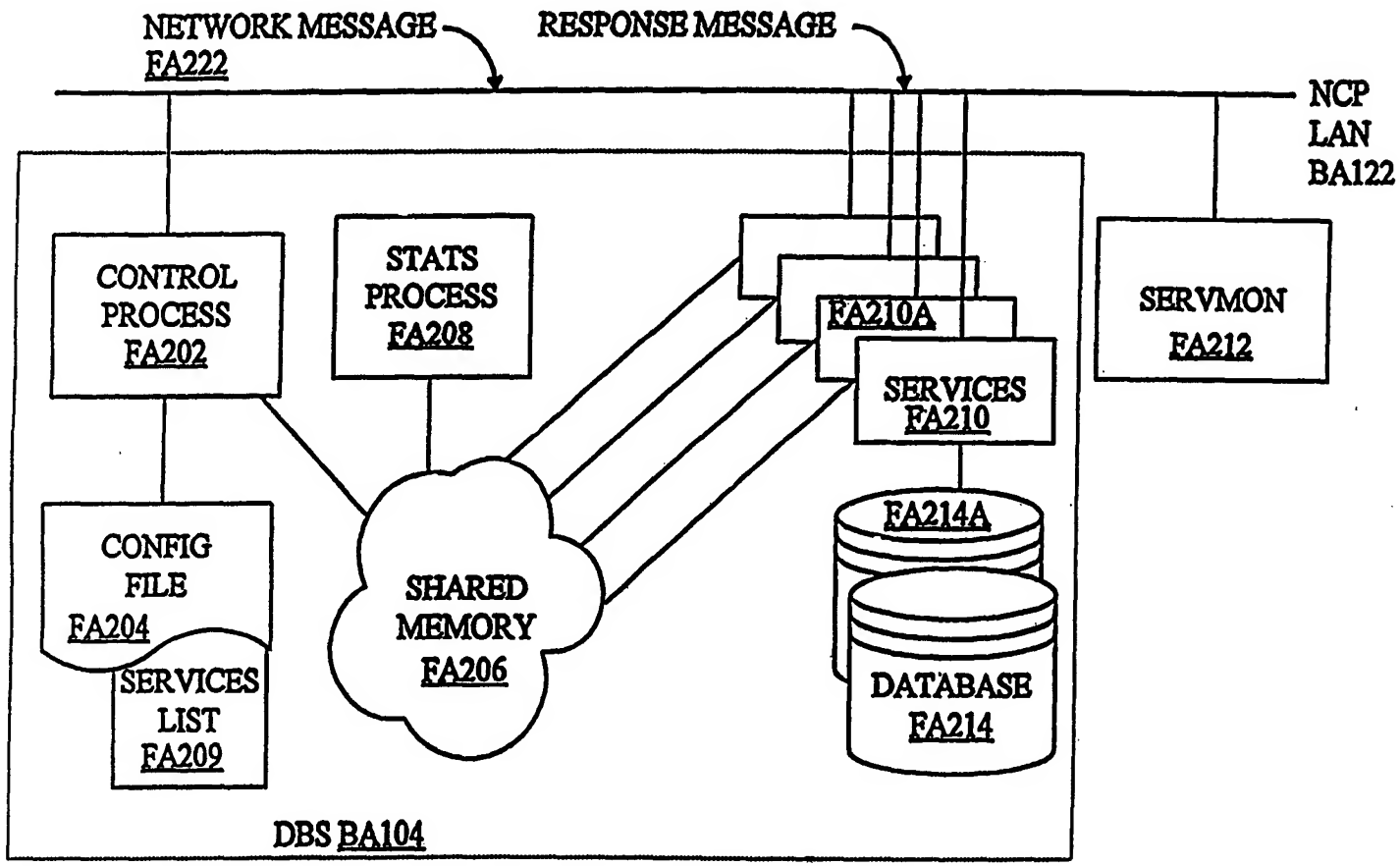

NETWORK MESSAGE
FA222
RESPONSE MESSAGE
NCP
LAN
BA122
CONTROL
PROCESS
FA202
STATS
PROCESS
FA208
FA210A
SERVICES
FA210
SERVMON
FA212
CONFIG
FILE
FA204
SERVICES
LIST
FA209
SHARED
MEMORY
FA206
FA214A
DATABASE
FA214
DBS BA104

FIG 69

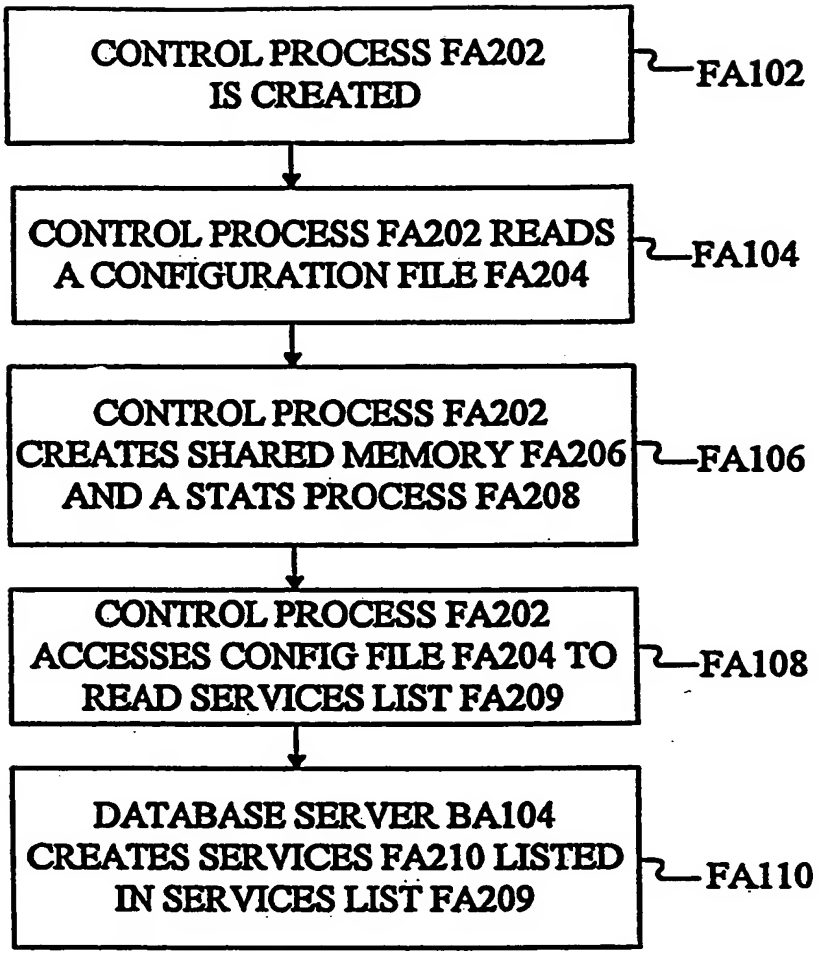

CONTROL PROCESS FA202 IS CREATED
FA102
CONTROL PROCESS FA202 READS A CONFIGURATION FILE FA204
FA104
CONTROL PROCESS FA202 CREATES SHARED MEMORY FA206 AND A STATS PROCESS FA208
FA106
CONTROL PROCESS FA202 ACCESSES CONFIG FILE FA204 TO READ SERVICES LIST FA209
FA108
DATABASE SERVER BA104 CREATES SERVICES FA210 LISTED IN SERVICES LIST FA209
FA110

FIG 70

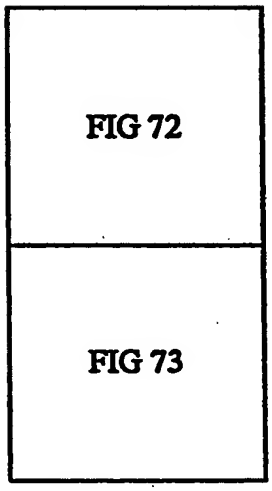


FIG 71

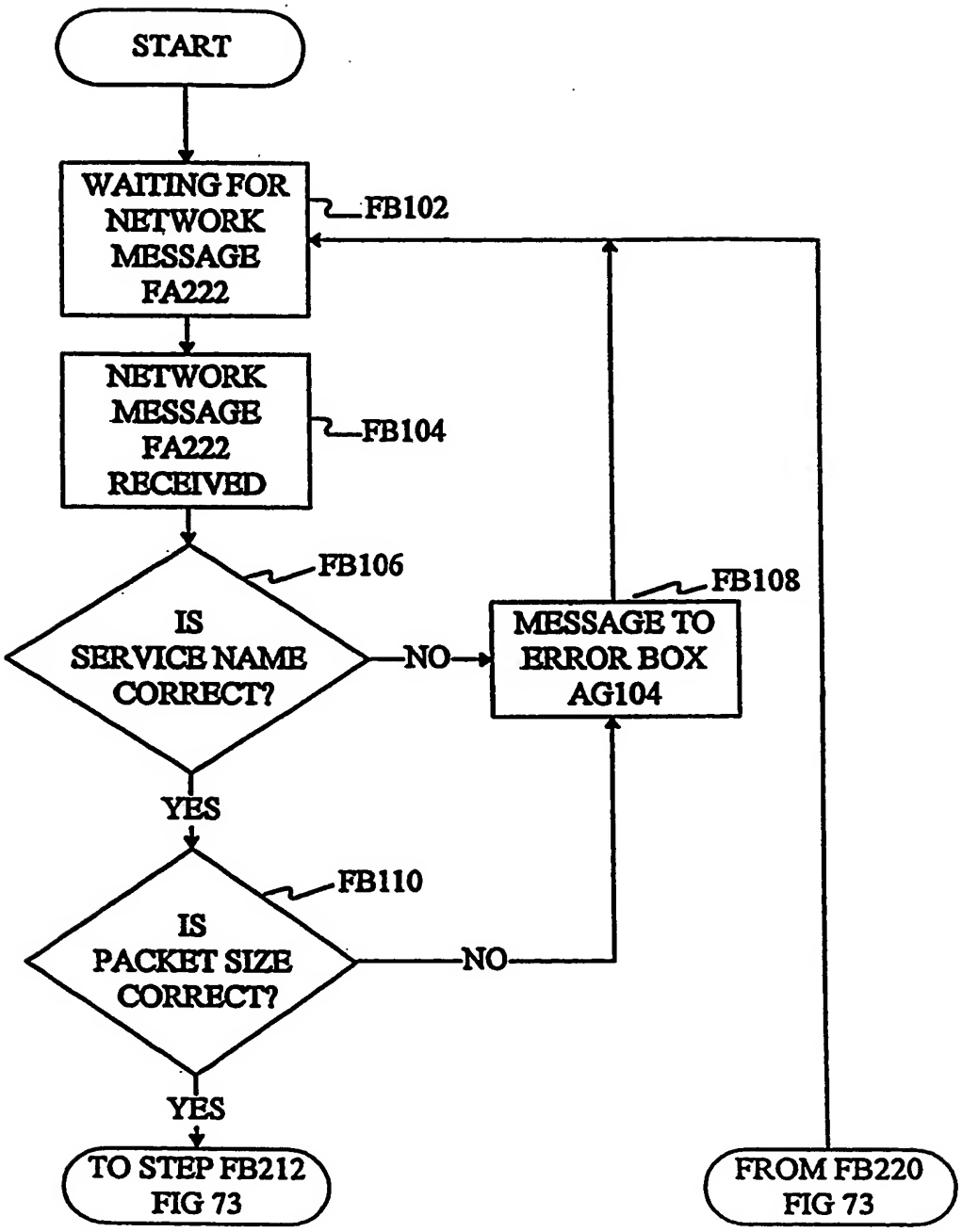

START
WAITING FOR NETWORK MESSAGE FA222
FB102
NETWORK MESSAGE FA222 RECEIVED
FB104
FB106
IS SERVICE NAME CORRECT?
NO
MESSAGE TO ERROR BOX AG104
FB108
YES
FB110
IS PACKET SIZE CORRECT?
NO
YES
TO STEP FB212 FIG 73
FROM FB220 FIG 73

FIG 72

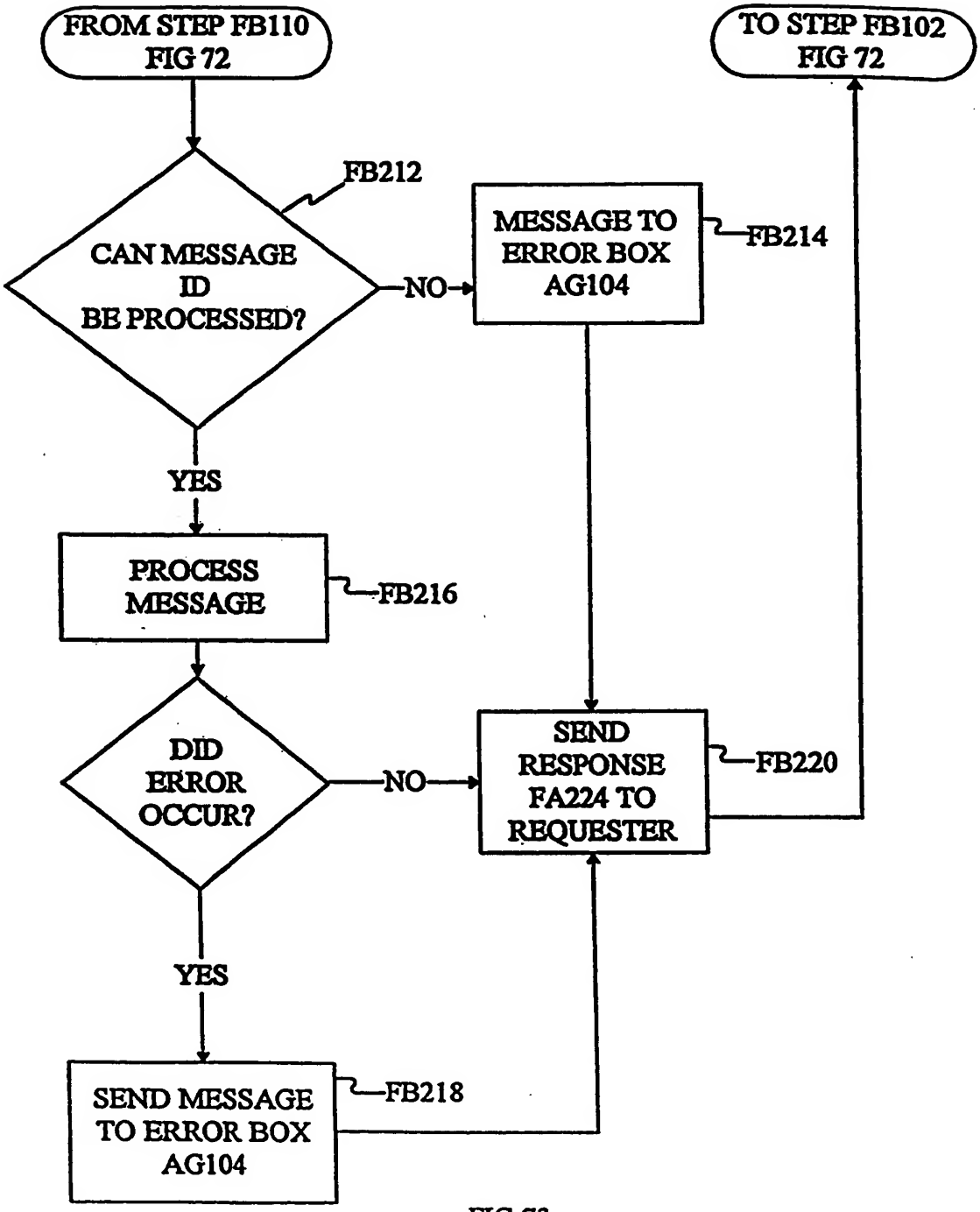

FROM STEP FB110
FIG 72
TO STEP FB102
FIG 72
FB212
CAN MESSAGE ID BE PROCESSED?
NO
MESSAGE TO ERROR BOX AG104
FB214
YES
PROCESS MESSAGE
FB216
DID ERROR OCCUR?
NO
SEND RESPONSE FA224 TO REQUESTER
FB220
YES
SEND MESSAGE TO ERROR BOX AG104
FB218

FIG 73

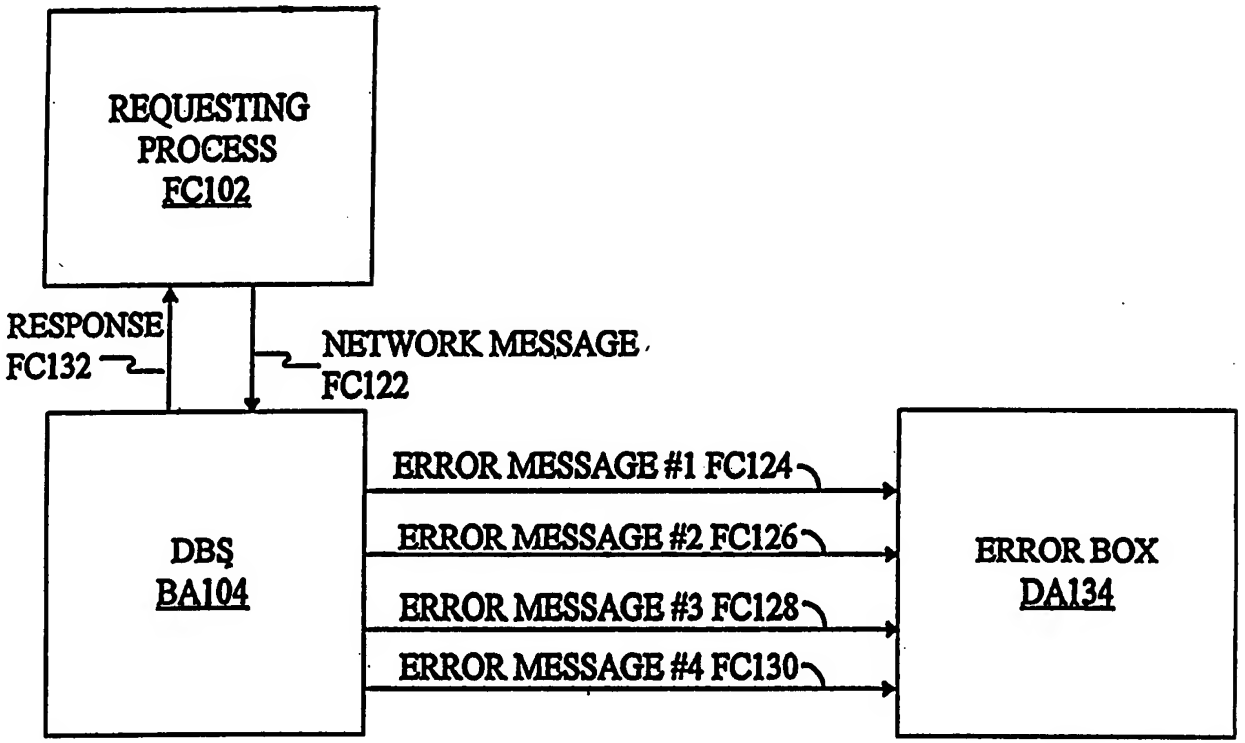

REQUESTING PROCESS FC102
RESPONSE FC132
NETWORK MESSAGE FC122
DBS BA104
ERROR MESSAGE #1 FC124
ERROR MESSAGE #2 FC126
ERROR MESSAGE #3 FC128
ERROR MESSAGE #4 FC130
ERROR BOX DA134

FIG 74

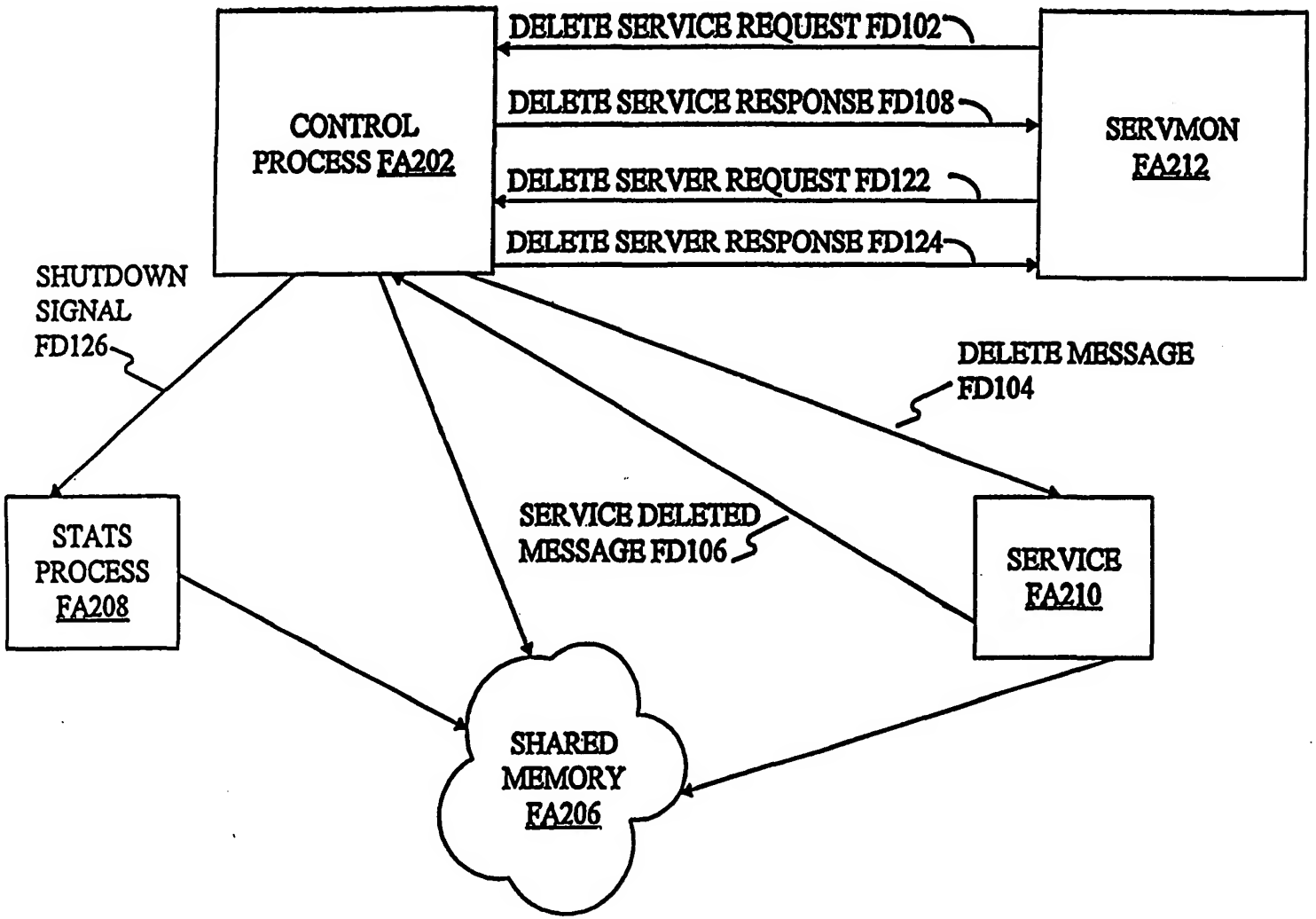

CONTROL PROCESS FA202
SERVMON FA212
DELETE SERVICE REQUEST FD102
DELETE SERVICE RESPONSE FD108
DELETE SERVER REQUEST FD122
DELETE SERVER RESPONSE FD124
SHUTDOWN SIGNAL FD126
DELETE MESSAGE FD104
STATS PROCESS FA208
SERVICE DELETED MESSAGE FD106
SERVICE FA210
SHARED MEMORY FA206

FIG 75

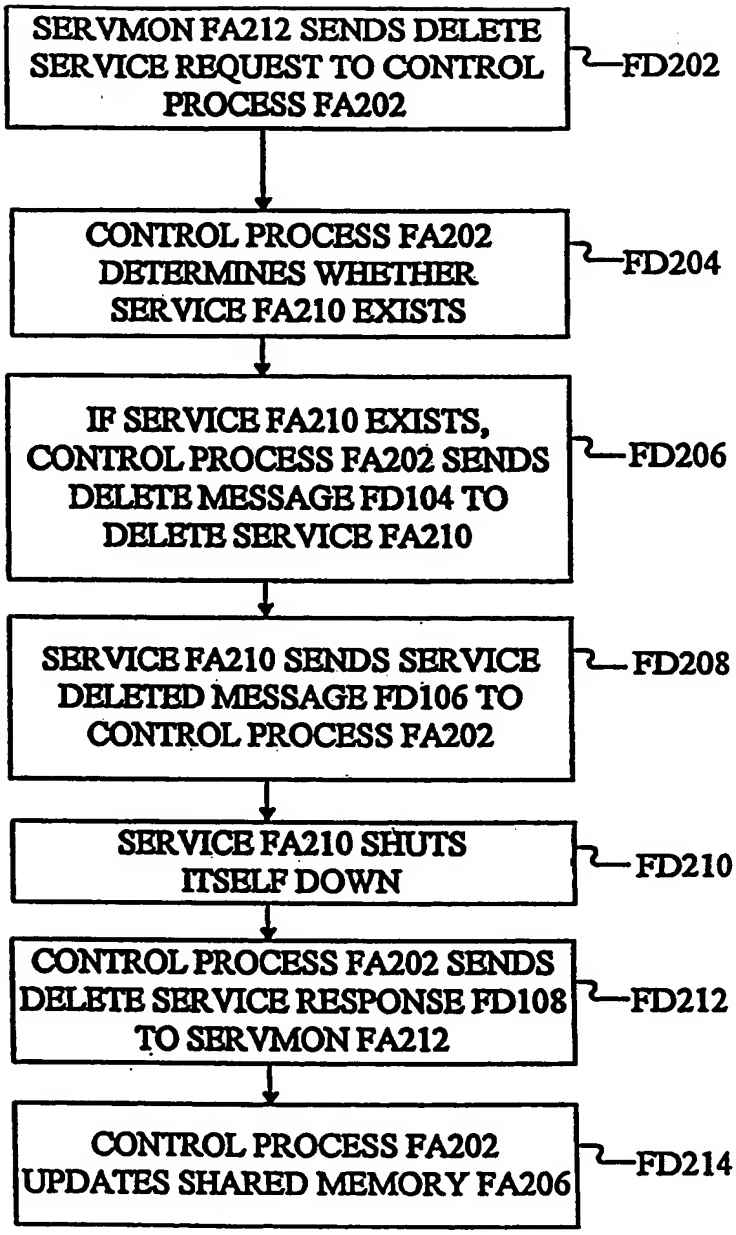

SERVMON FA212 SENDS DELETE SERVICE REQUEST TO CONTROL PROCESS FA202
FD202
CONTROL PROCESS FA202 DETERMINES WHETHER SERVICE FA210 EXISTS
FD204
IF SERVICE FA210 EXISTS, CONTROL PROCESS FA202 SENDS DELETE MESSAGE FD104 TO DELETE SERVICE FA210
FD206
SERVICE FA210 SENDS SERVICE DELETED MESSAGE FD106 TO CONTROL PROCESS FA202
FD208
SERVICE FA210 SHUTS ITSELF DOWN
FD210
CONTROL PROCESS FA202 SENDS DELETE SERVICE RESPONSE FD108 TO SERVMON FA212
FD212
CONTROL PROCESS FA202 UPDATES SHARED MEMORY FA206
FD214

FIG 76

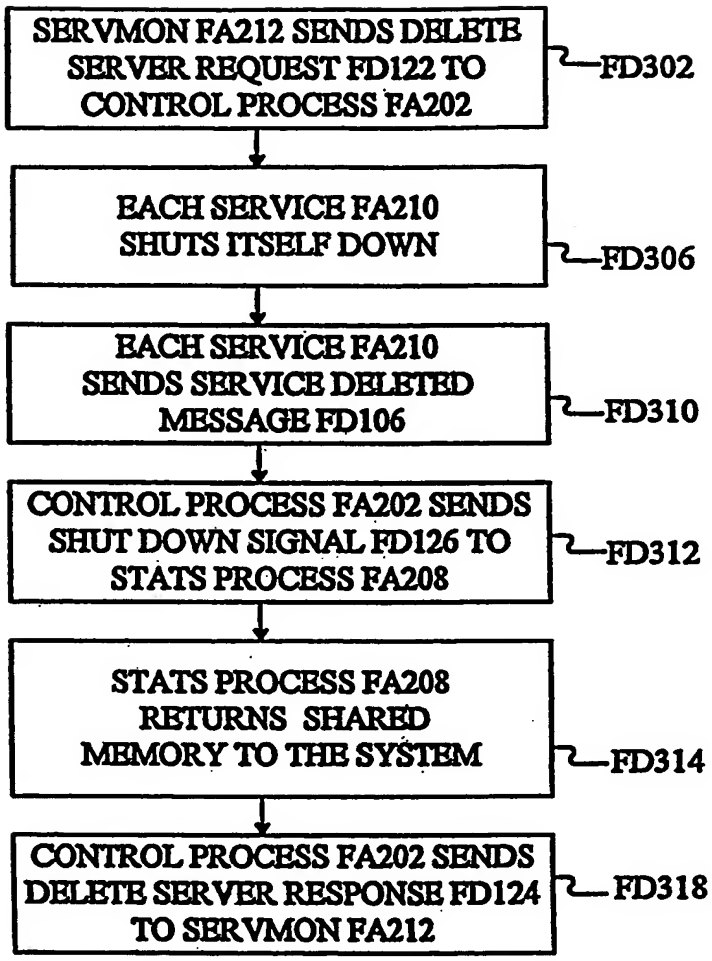

SERVMON FA212 SENDS DELETE SERVER REQUEST FD122 TO CONTROL PROCESS FA202
FD302
EACH SERVICE FA210 SHUTS ITSELF DOWN
FD306
EACH SERVICE FA210 SENDS SERVICE DELETED MESSAGE FD106
FD310
CONTROL PROCESS FA202 SENDS SHUT DOWN SIGNAL FD126 TO STATS PROCESS FA208
FD312
STATS PROCESS FA208 RETURNS SHARED MEMORY TO THE SYSTEM
FD314
CONTROL PROCESS FA202 SENDS DELETE SERVER RESPONSE FD124 TO SERVMON FA212
FD318

FIG 77

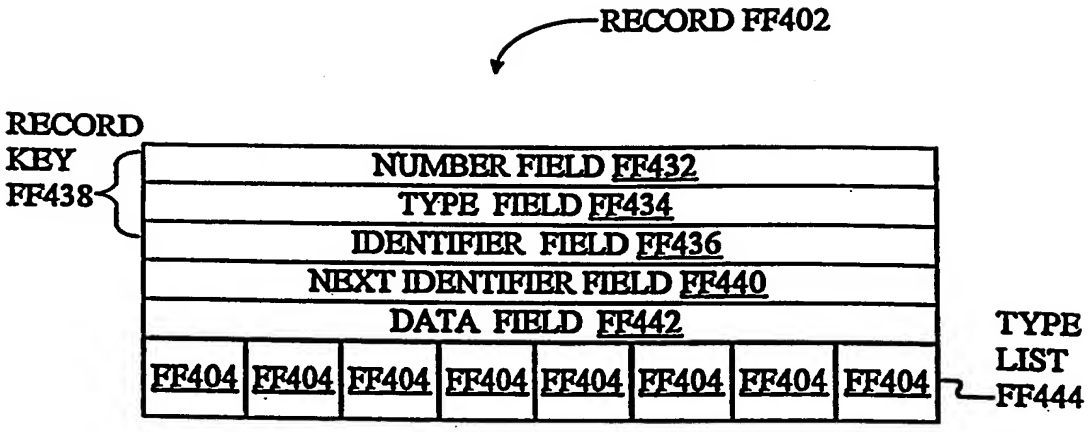

RECORD FF402
RECORD KEY FF438
NUMBER FIELD FF432
TYPE FIELD FF434
IDENTIFIER FIELD FF436
NEXT IDENTIFIER FIELD FF440
DATA FIELD FF442
FF404
FF404
FF404
FF404
FF404
FF404
FF404
FF404
TYPE LIST FF444

FIG 78A

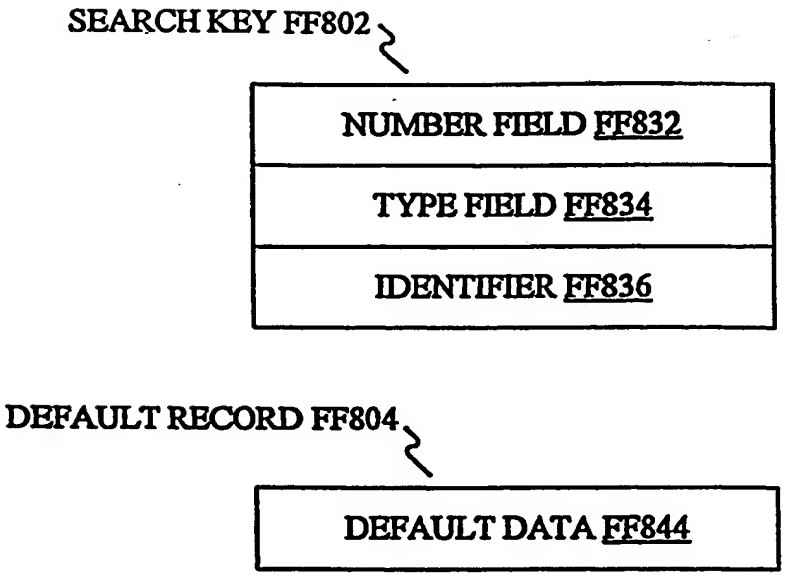

SEARCH KEY FF802
NUMBER FIELD FF832
TYPE FIELD FF834
IDENTIFIER FF836
DEFAULT RECORD FF804
DEFAULT DATA FF844

FIG 78B

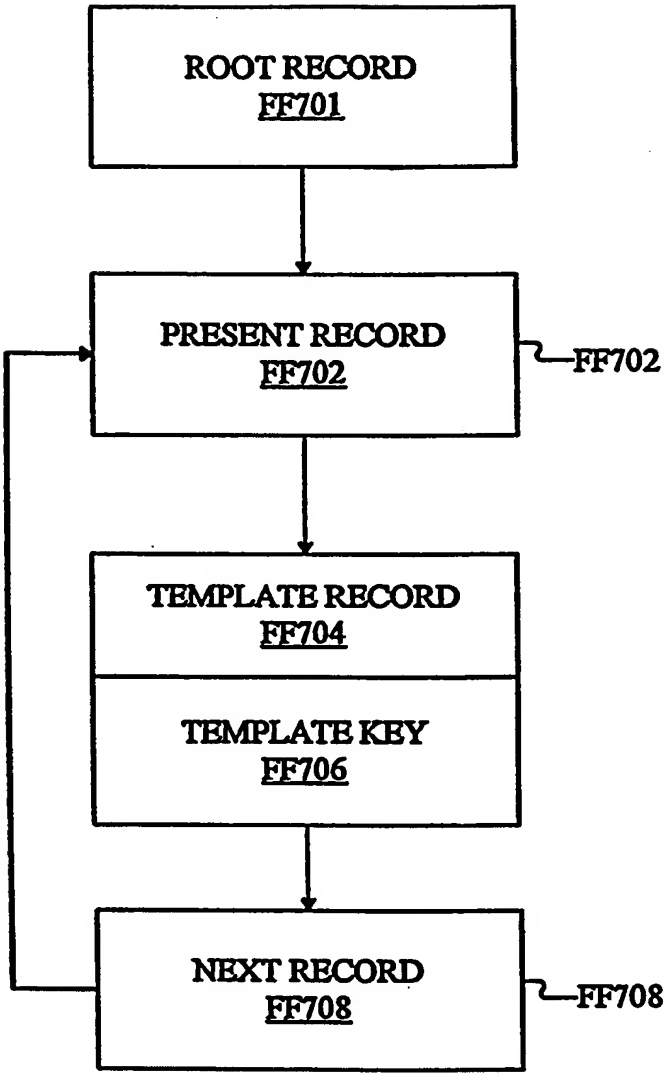

ROOT RECORD
FF701
PRESENT RECORD
FF702
FF702
TEMPLATE RECORD
FF704
TEMPLATE KEY
FF706
NEXT RECORD
FF708
FF708

FIG 79

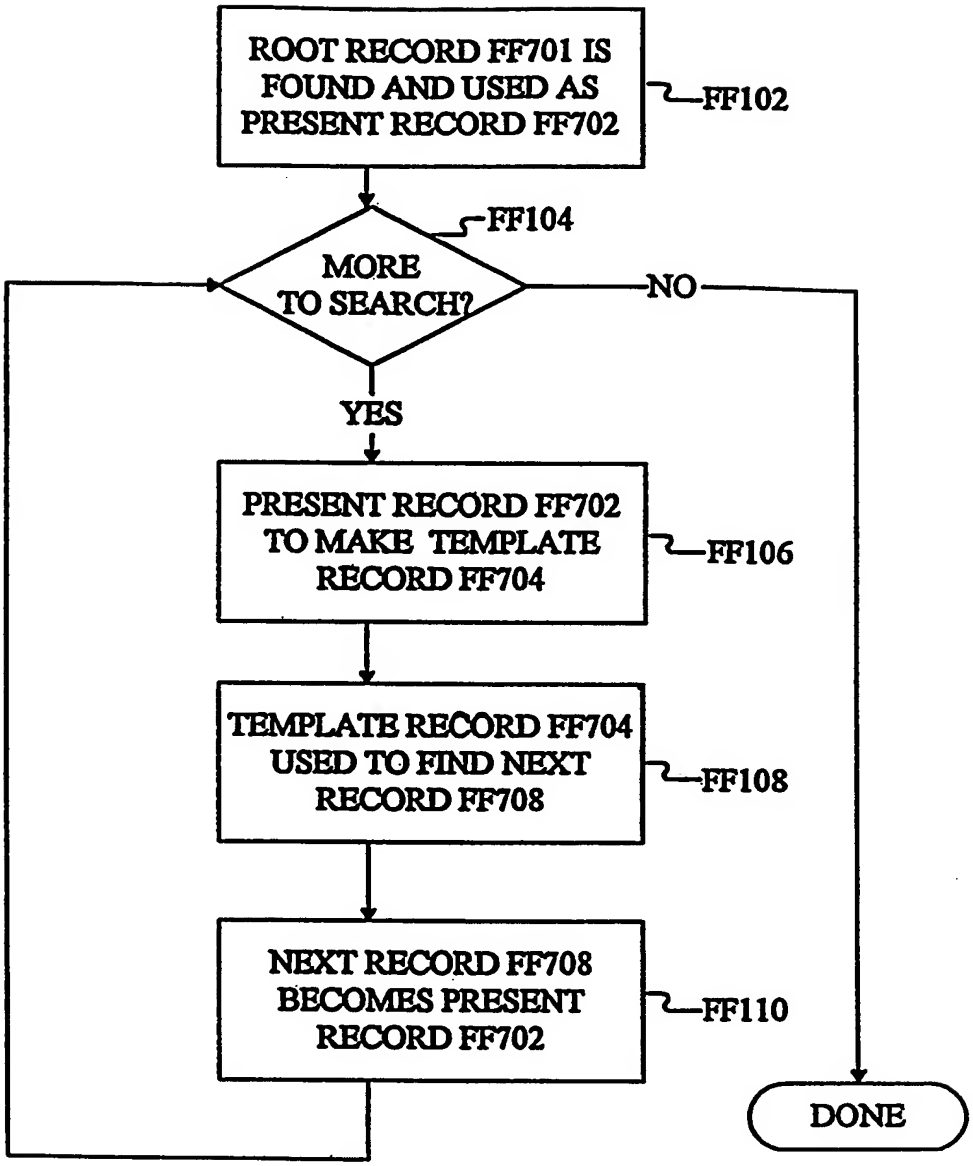

ROOT RECORD FF701 IS FOUND AND USED AS PRESENT RECORD FF702
FF102
FF104
MORE TO SEARCH?
NO
YES
PRESENT RECORD FF702 TO MAKE TEMPLATE RECORD FF704
FF106
TEMPLATE RECORD FF704 USED TO FIND NEXT RECORD FF708
FF108
NEXT RECORD FF708 BECOMES PRESENT RECORD FF702
FF110
DONE

FIG 80

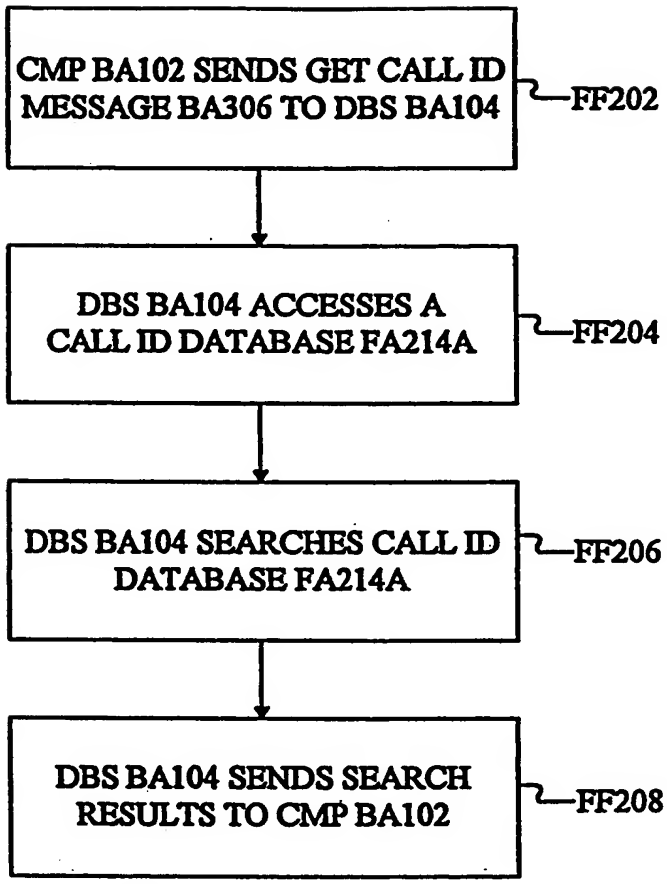
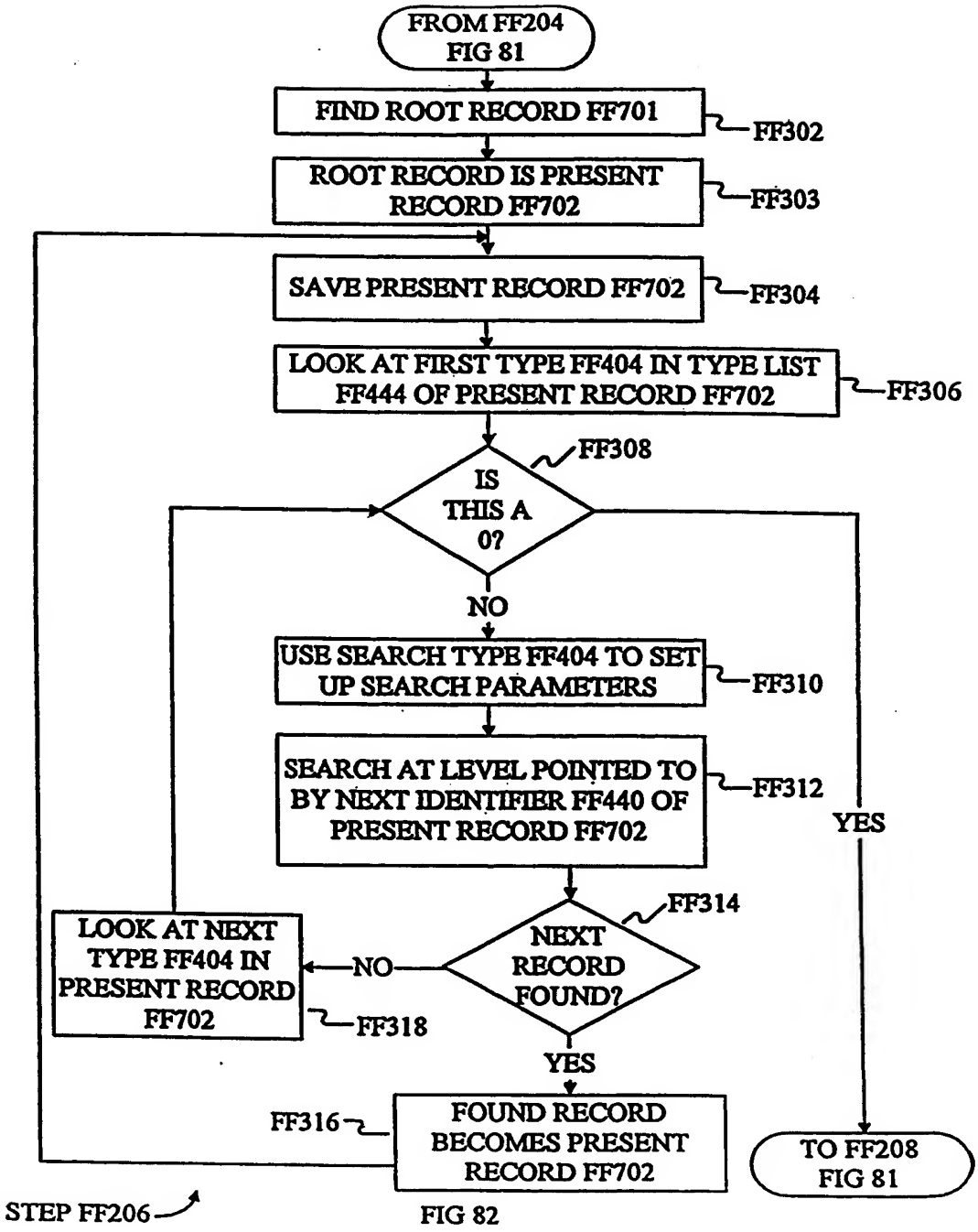

CMP BA102 SENDS GET CALL ID MESSAGE BA306 TO DBS BA104
FF202
DBS BA104 ACCESSES A CALL ID DATABASE FA214A
FF204
DBS BA104 SEARCHES CALL ID DATABASE FA214A
FF206
DBS BA104 SENDS SEARCH RESULTS TO CMP BA102
FF208

FIG 81


FROM FF204
FIG 81
FIND ROOT RECORD FF701
FF302
ROOT RECORD IS PRESENT RECORD FF702
FF303
SAVE PRESENT RECORD FF702
FF304
LOOK AT FIRST TYPE FF404 IN TYPE LIST FF444 OF PRESENT RECORD FF702
FF306
FF308
IS THIS A 0?
NO
YES
USE SEARCH TYPE FF404 TO SET UP SEARCH PARAMETERS
FF310
SEARCH AT LEVEL POINTED TO BY NEXT IDENTIFIER FF440 OF PRESENT RECORD FF702
FF312
FF314
NEXT RECORD FOUND?
NO
LOOK AT NEXT TYPE FF404 IN PRESENT RECORD FF702
FF318
YES
FF316
FOUND RECORD BECOMES PRESENT RECORD FF702
TO FF208
FIG 81
STEP FF206
FIG 82

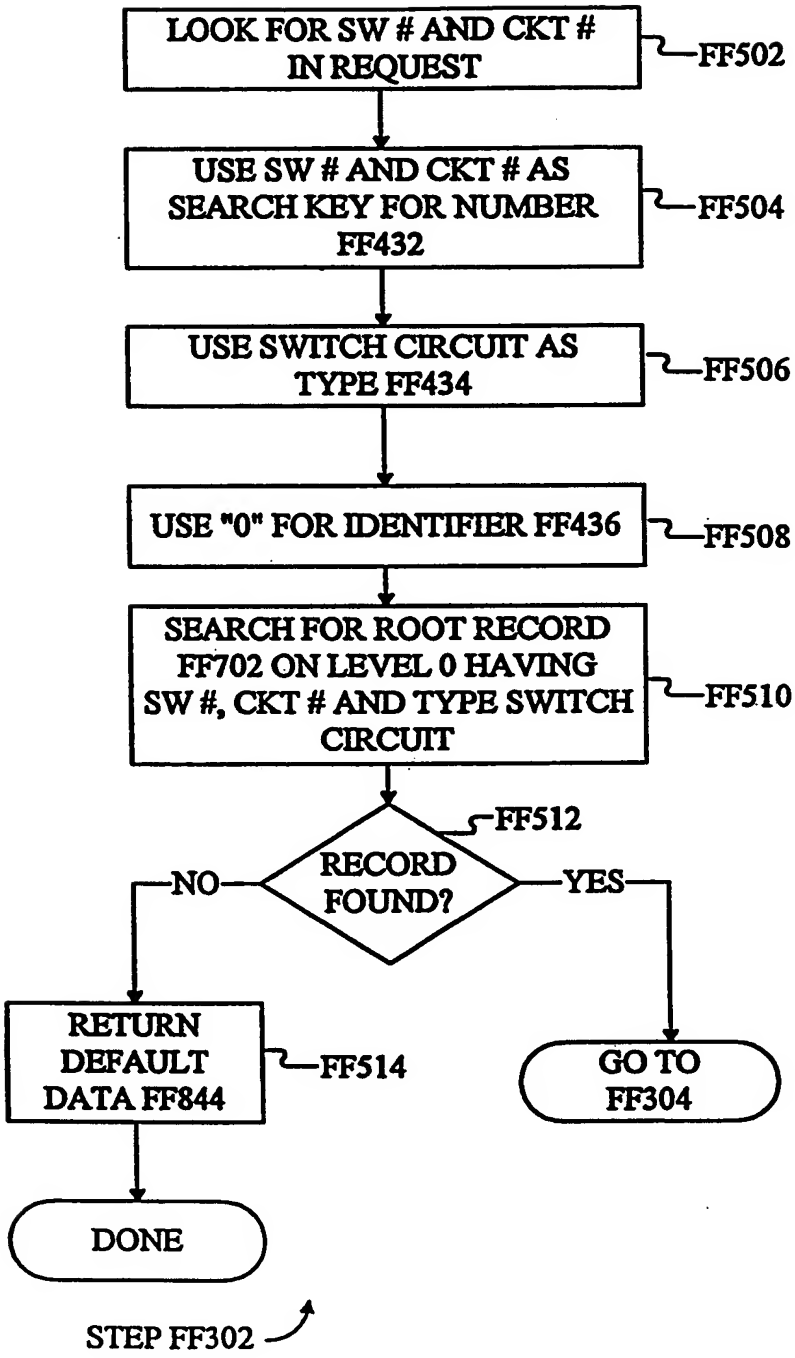

LOOK FOR SW # AND CKT # IN REQUEST
FF502
USE SW # AND CKT # AS SEARCH KEY FOR NUMBER FF432
FF504
USE SWITCH CIRCUIT AS TYPE FF434
FF506
USE "0" FOR IDENTIFIER FF436
FF508
SEARCH FOR ROOT RECORD FF702 ON LEVEL 0 HAVING SW #, CKT # AND TYPE SWITCH CIRCUIT
FF510
FF512
RECORD FOUND?
NO
YES
RETURN DEFAULT DATA FF844
FF514
GO TO FF304
DONE
STEP FF302

FIG 83

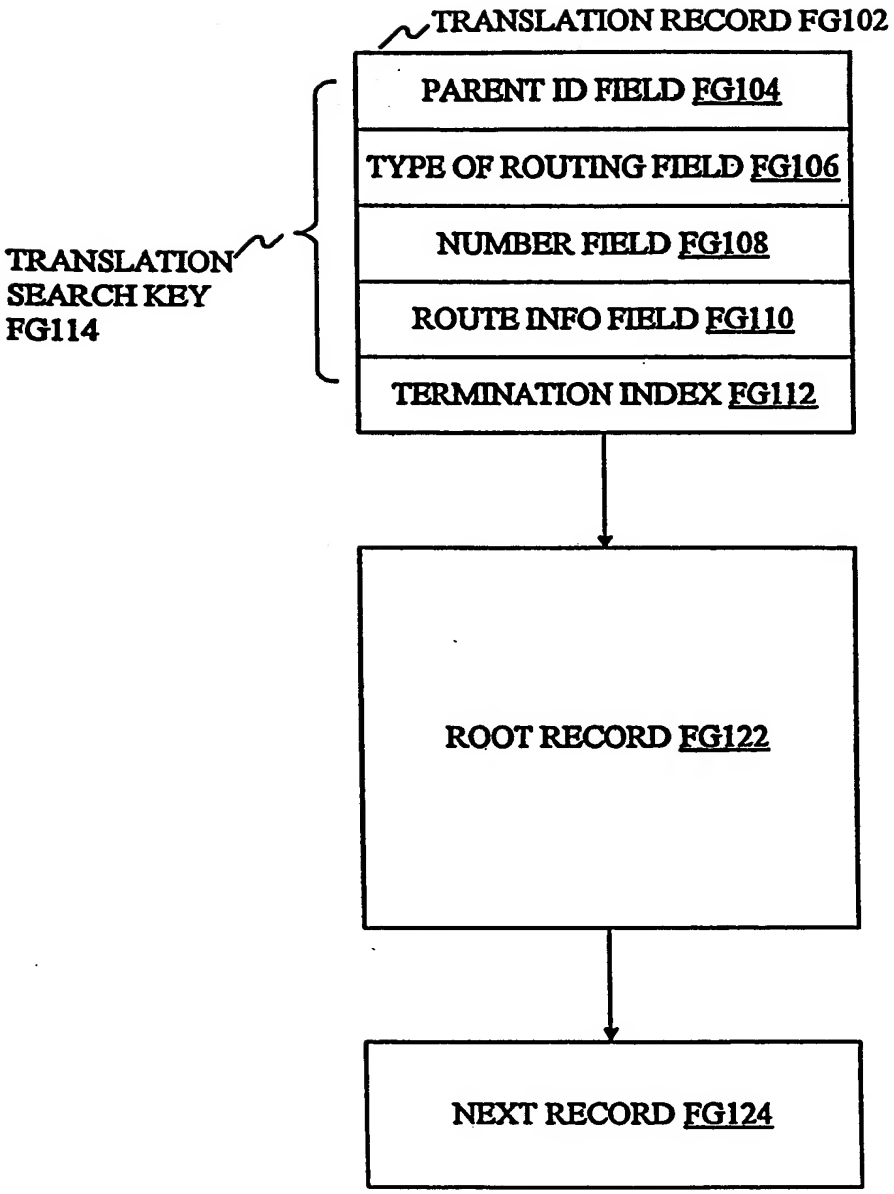

TRANSLATION RECORD FG102
PARENT ID FIELD FG104
TYPE OF ROUTING FIELD FG106
NUMBER FIELD FG108
ROUTE INFO FIELD FG110
TERMINATION INDEX FG112
TRANSLATION SEARCH KEY FG114
ROOT RECORD FG122
NEXT RECORD FG124

FIG 84

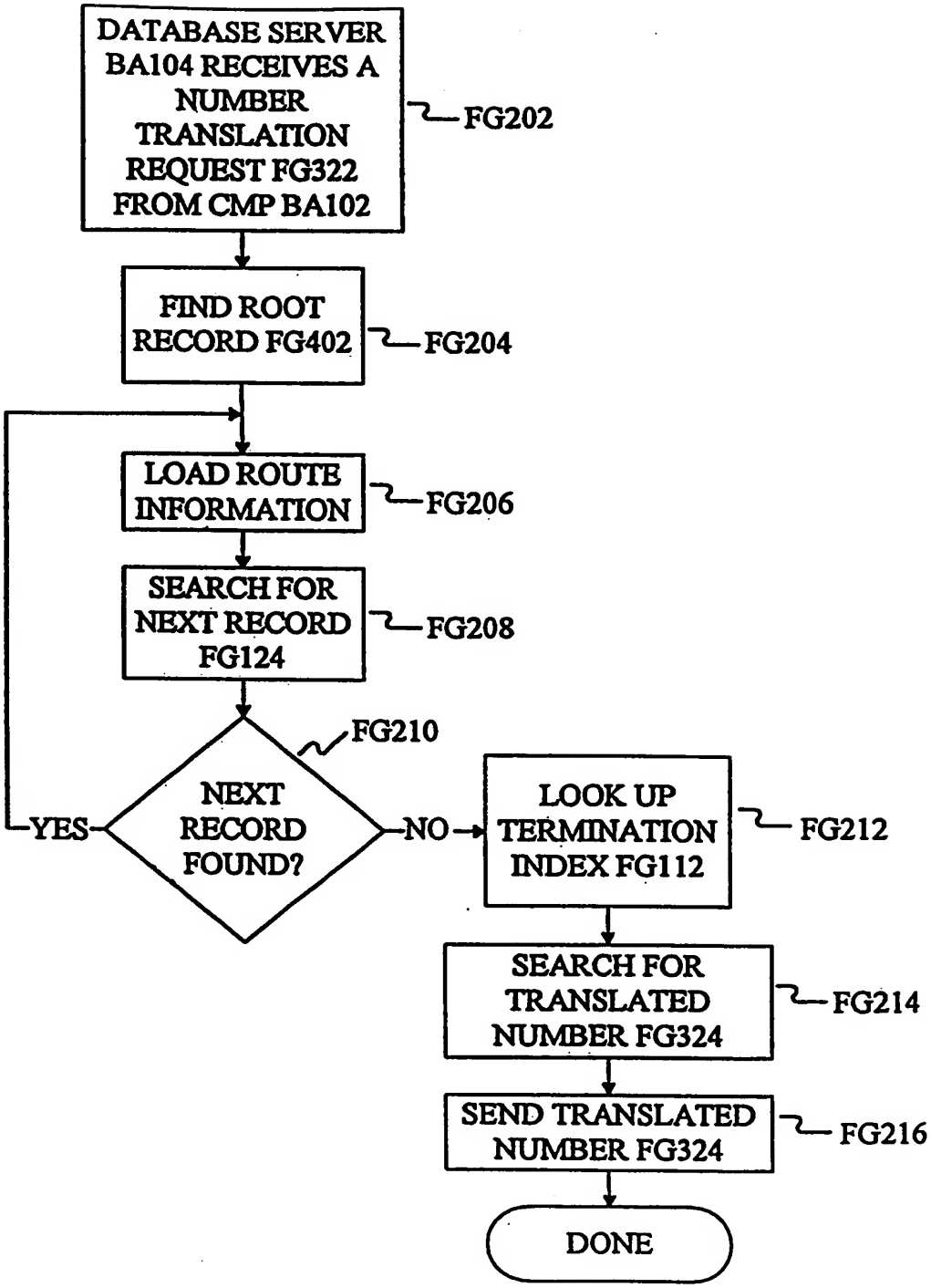

DATABASE SERVER BA104 RECEIVES A NUMBER TRANSLATION REQUEST FG322 FROM CMP BA102
FG202
FIND ROOT RECORD FG402
FG204
LOAD ROUTE INFORMATION
FG206
SEARCH FOR NEXT RECORD FG124
FG208
FG210
NEXT RECORD FOUND?
YES
NO
LOOK UP TERMINATION INDEX FG112
FG212
SEARCH FOR TRANSLATED NUMBER FG324
FG214
SEND TRANSLATED NUMBER FG324
FG216
DONE

FIG 85

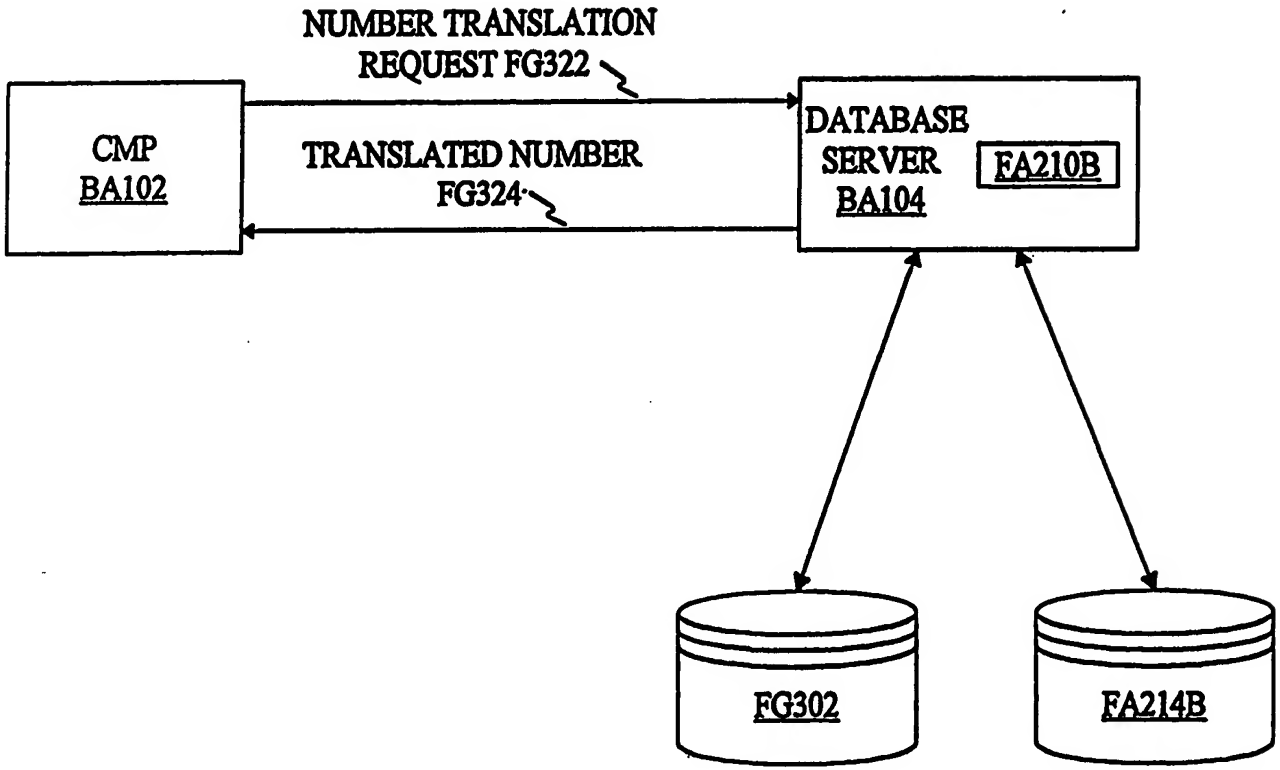

NUMBER TRANSLATION
REQUEST FG322
CMP
BA102
TRANSLATED NUMBER
FG324
DATABASE
SERVER
BA104
FA210B
FG302
FA214B

FIG 86

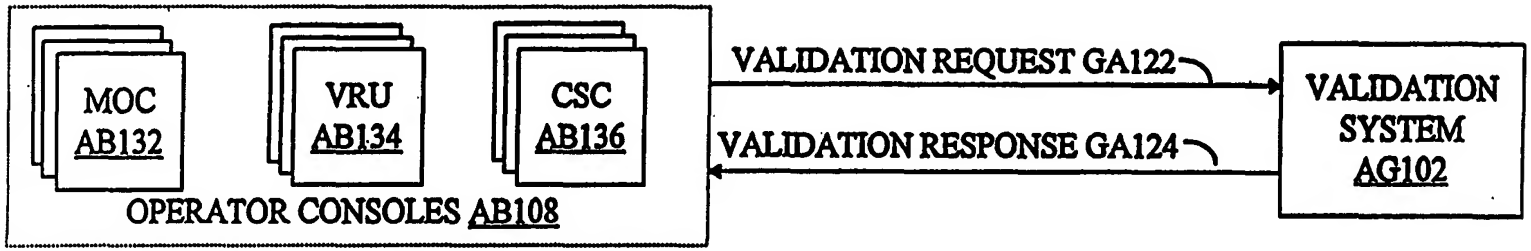

MOC
AB132
VRU
AB134
CSC
AB136
OPERATOR CONSOLES AB108
VALIDATION REQUEST GA122
VALIDATION RESPONSE GA124
VALIDATION
SYSTEM
AG102

FIG 87

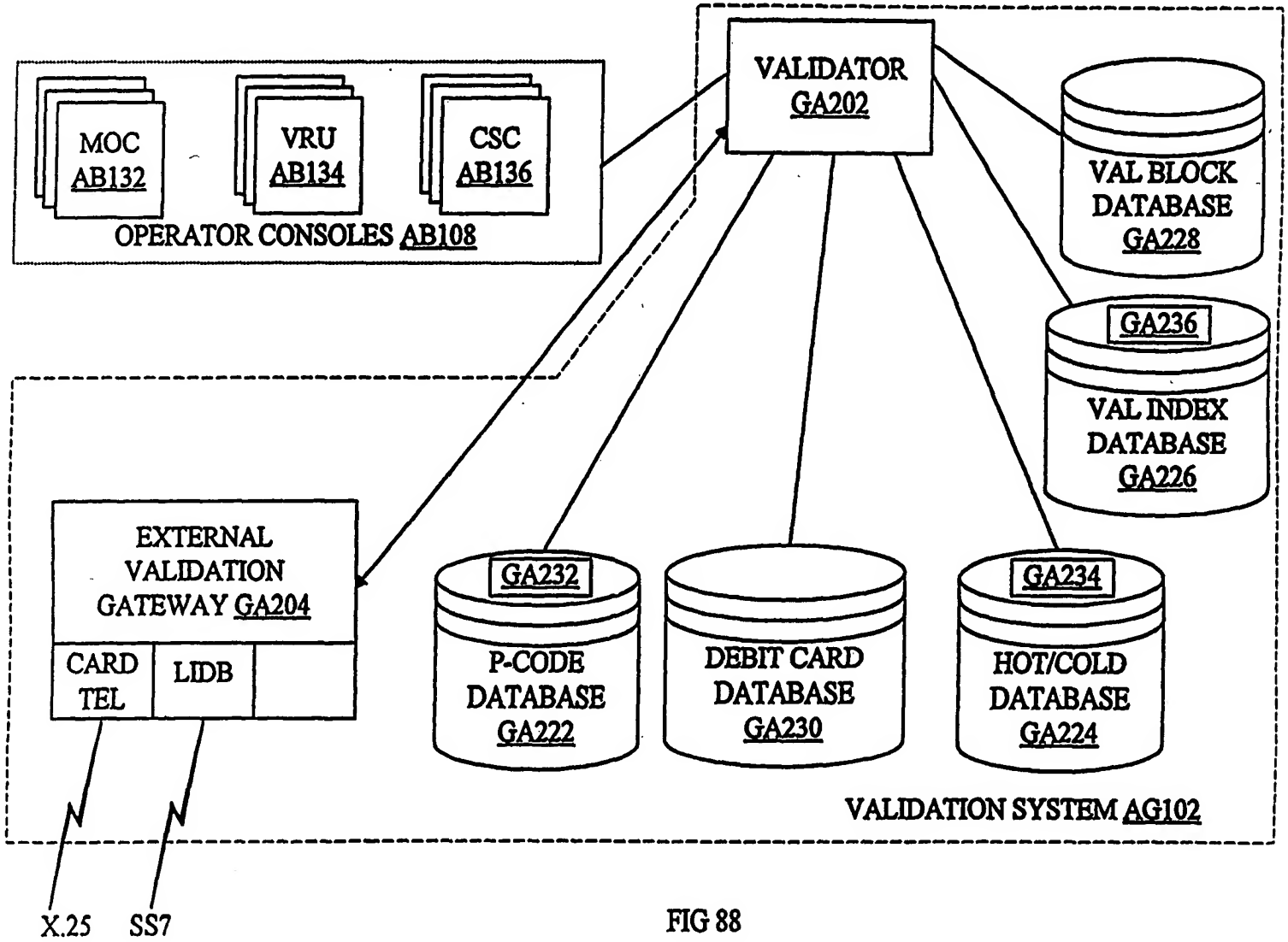

VALIDATOR
GA202
MOC
AB132
VRU
AB134
CSC
AB136
OPERATOR CONSOLES AB108
VAL BLOCK
DATABASE
GA228
GA236
VAL INDEX
DATABASE
GA226
EXTERNAL
VALIDATION
GATEWAY GA204
CARD
TEL
LIDB
GA232
P-CODE
DATABASE
GA222
DEBIT CARD
DATABASE
GA230
GA234
HOT/COLD
DATABASE
GA224
VALIDATION SYSTEM AG102
X.25
SS7

FIG 88

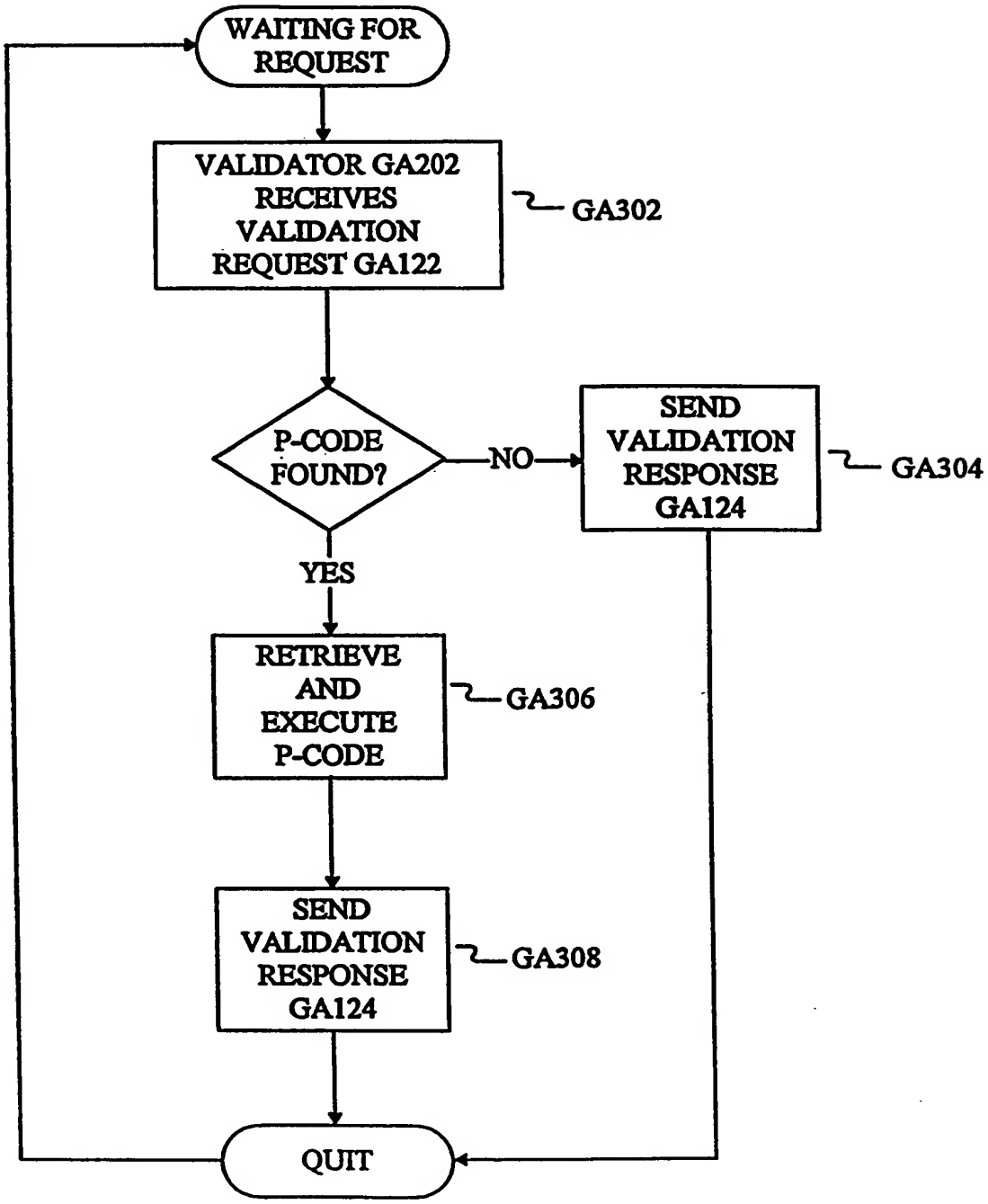

WAITING FOR REQUEST
VALIDATOR GA202 RECEIVES VALIDATION REQUEST GA122
GA302
P-CODE FOUND?
NO
SEND VALIDATION RESPONSE GA124
GA304
YES
RETRIEVE AND EXECUTE P-CODE
GA306
SEND VALIDATION RESPONSE GA124
GA308
QUIT

FIG 89

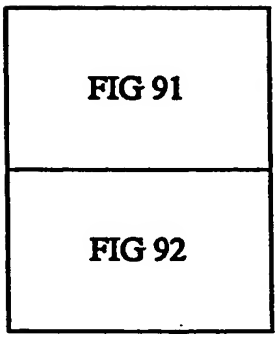


FIG 90

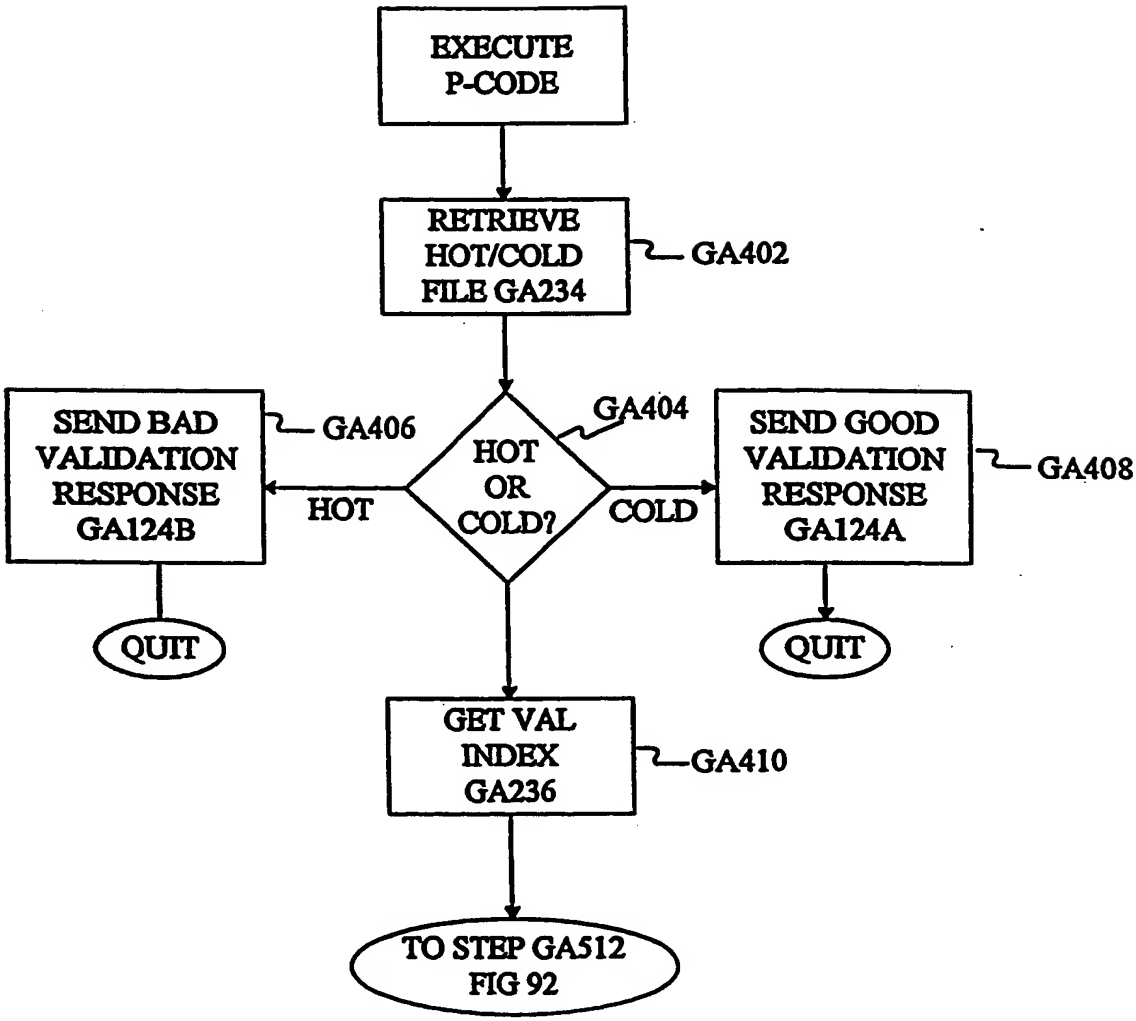

EXECUTE P-CODE
RETRIEVE HOT/COLD FILE GA234
GA402
HOT OR COLD?
GA404
HOT
COLD
SEND BAD VALIDATION RESPONSE GA124B
GA406
SEND GOOD VALIDATION RESPONSE GA124A
GA408
QUIT
QUIT
GET VAL INDEX GA236
GA410
TO STEP GA512 FIG 92

FIG 91

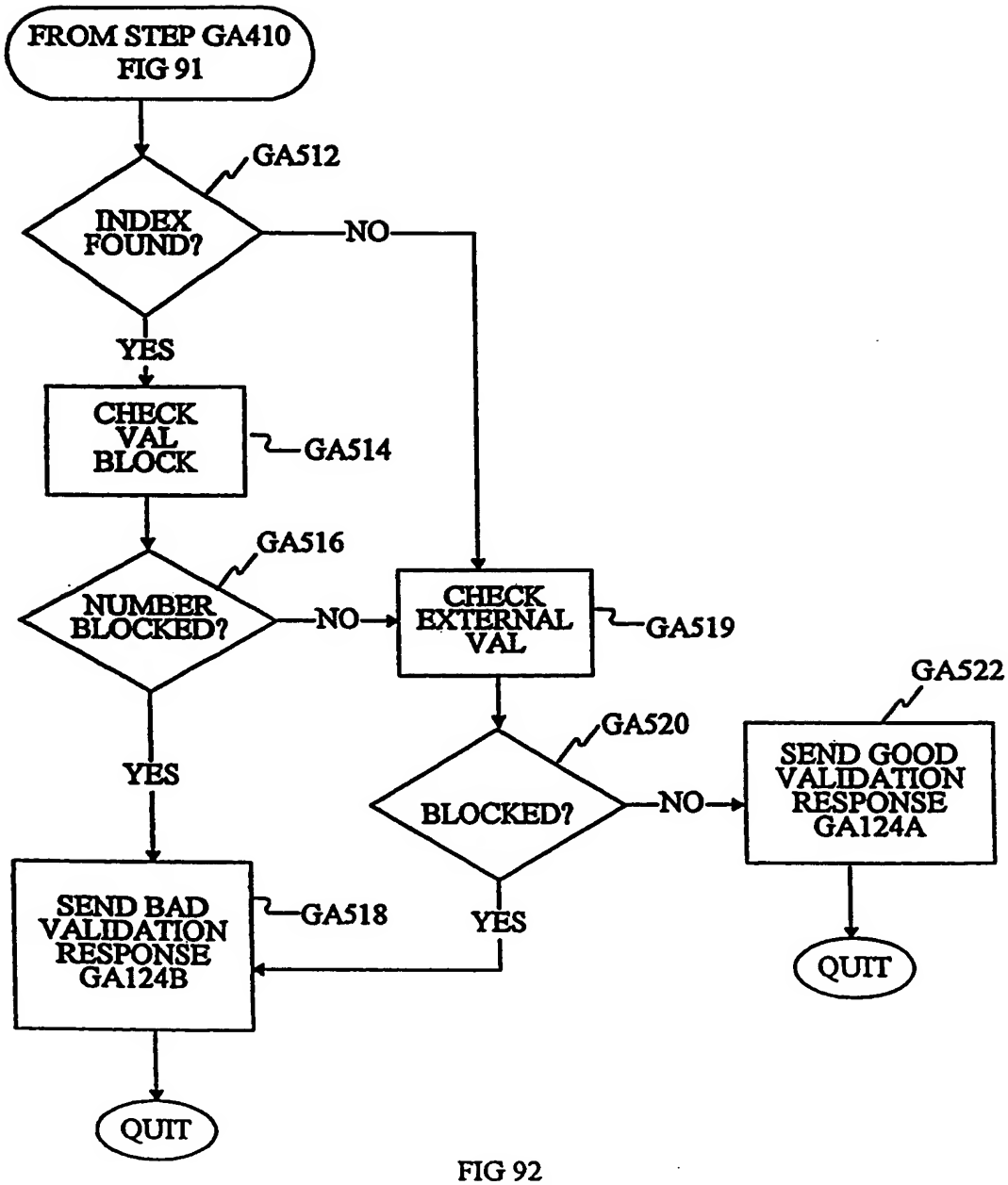

FROM STEP GA410
FIG 91
GA512
INDEX FOUND?
NO
YES
CHECK VAL BLOCK
GA514
GA516
NUMBER BLOCKED?
NO
CHECK EXTERNAL VAL
GA519
GA522
GA520
SEND GOOD VALIDATION RESPONSE GA124A
YES
BLOCKED?
NO
SEND BAD VALIDATION RESPONSE GA124B
GA518
YES
QUIT
QUIT

FIG 92

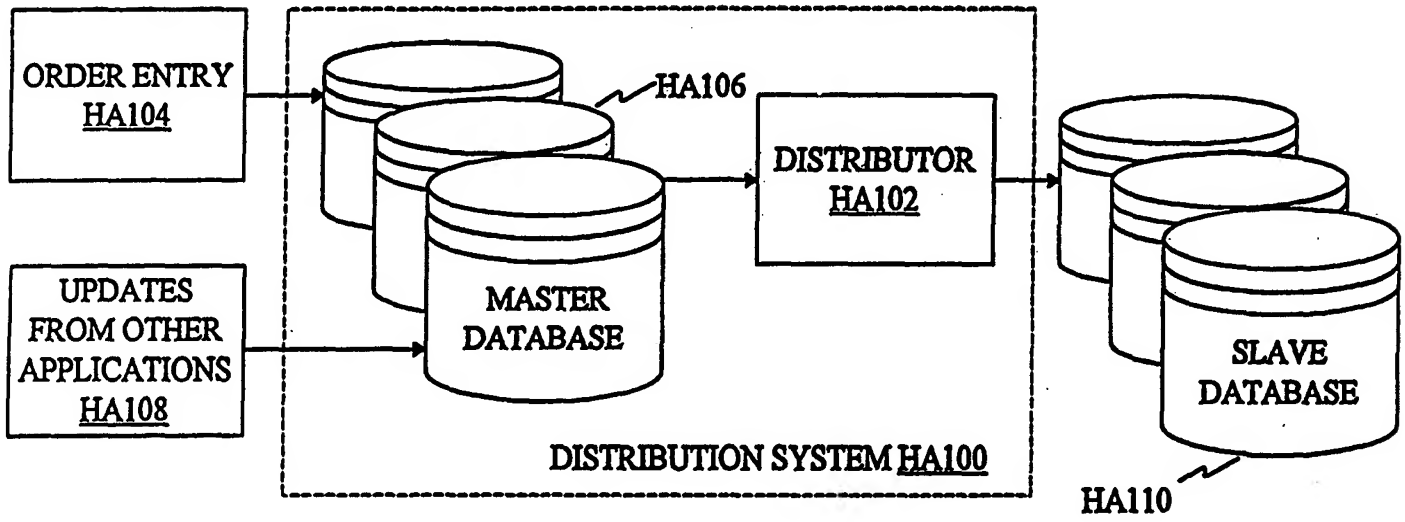

ORDER ENTRY
HA104
UPDATES
FROM OTHER
APPLICATIONS
HA108
HA106
MASTER
DATABASE
DISTRIBUTOR
HA102
SLAVE
DATABASE
DISTRIBUTION SYSTEM HA100
HA110

FIG 93

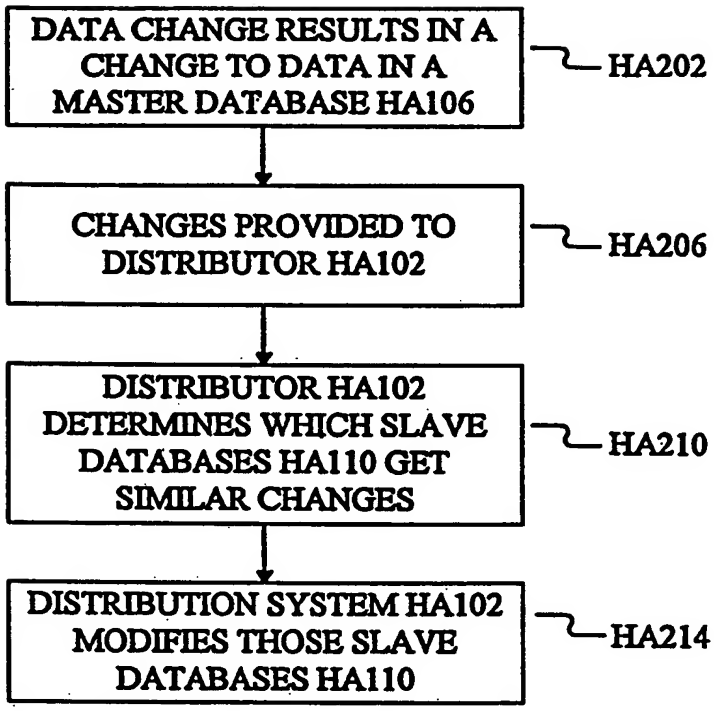

DATA CHANGE RESULTS IN A CHANGE TO DATA IN A MASTER DATABASE HA106
HA202
CHANGES PROVIDED TO DISTRIBUTOR HA102
HA206
DISTRIBUTOR HA102 DETERMINES WHICH SLAVE DATABASES HA110 GET SIMILAR CHANGES
HA210
DISTRIBUTION SYSTEM HA102 MODIFIES THOSE SLAVE DATABASES HA110
HA214

FIG 94

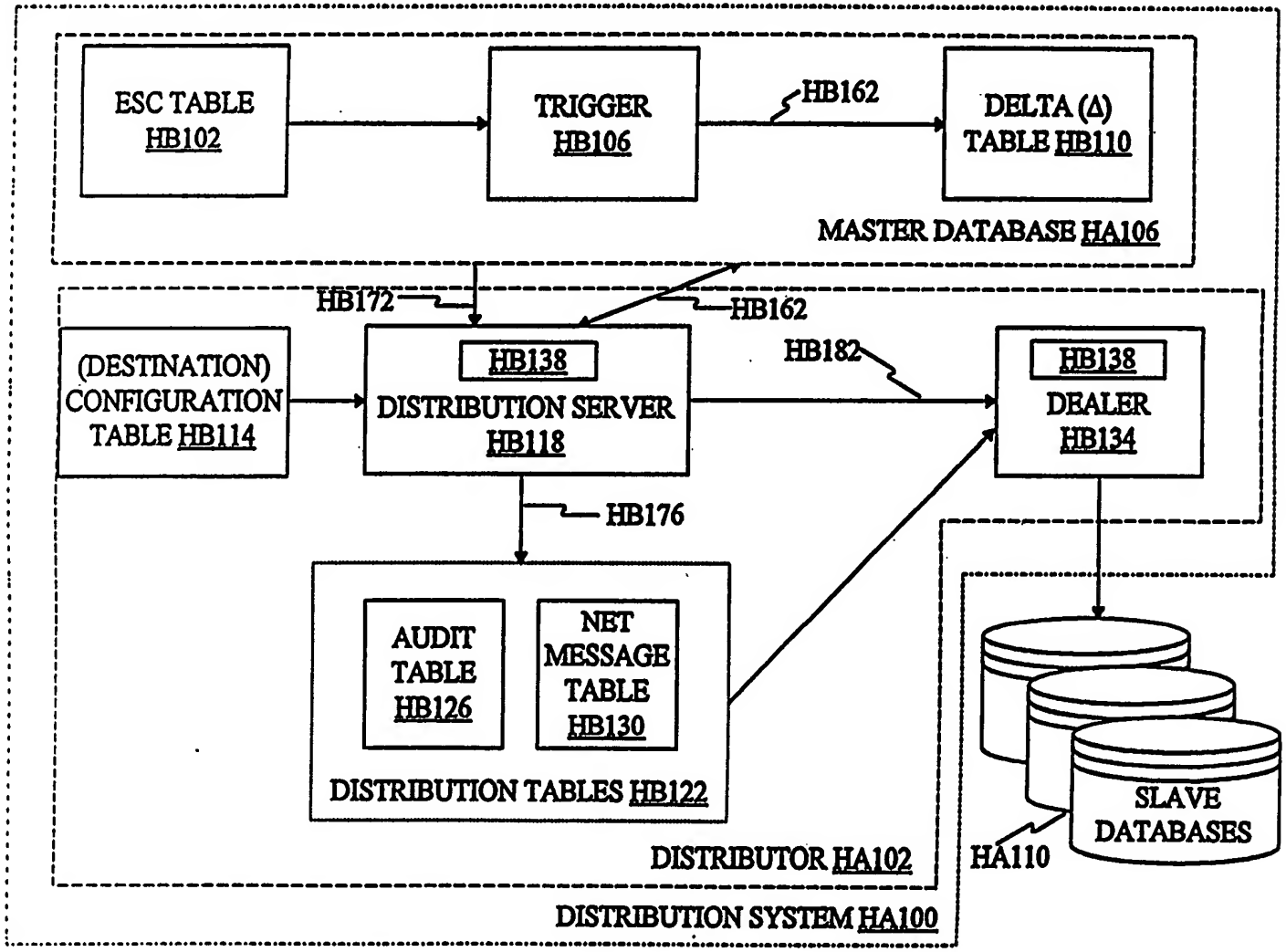

ESC TABLE HB102
TRIGGER HB106
HB162
DELTA (Δ) TABLE HB110
MASTER DATABASE HA106
HB172
HB162
(DESTINATION) CONFIGURATION TABLE HB114
HB138
DISTRIBUTION SERVER HB118
HB182
HB138
DEALER HB134
HB176
AUDIT TABLE HB126
NET MESSAGE TABLE HB130
DISTRIBUTION TABLES HB122
SLAVE DATABASES
HA110
DISTRIBUTOR HA102
DISTRIBUTION SYSTEM HA100

FIG 95

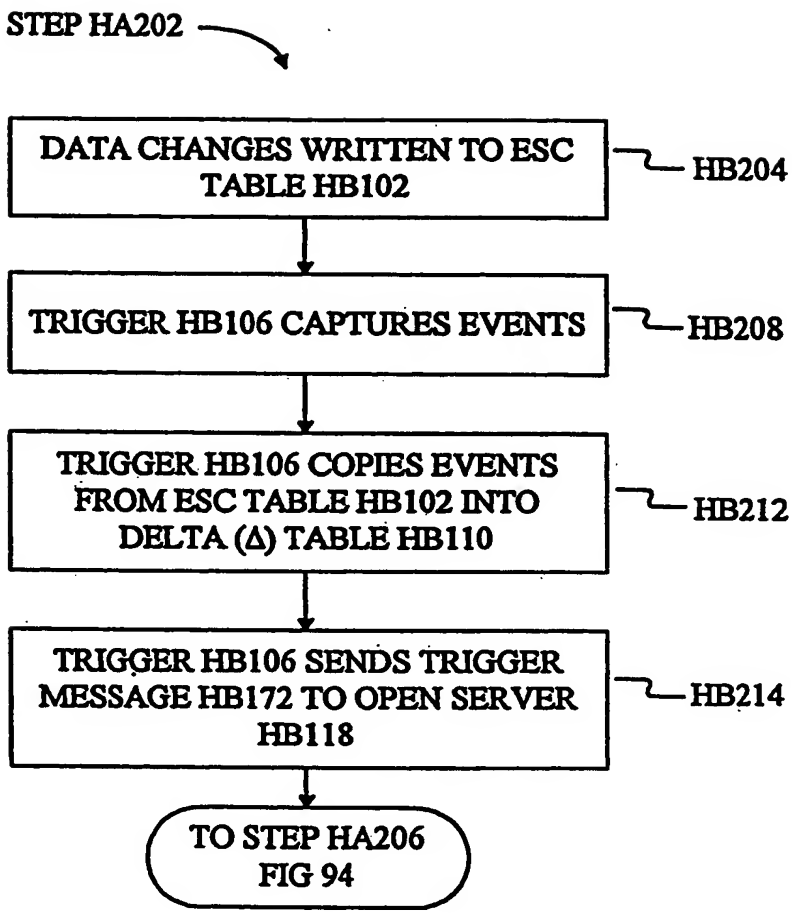

STEP HA202
DATA CHANGES WRITTEN TO ESC TABLE HB102
HB204
TRIGGER HB106 CAPTURES EVENTS
HB208
TRIGGER HB106 COPIES EVENTS FROM ESC TABLE HB102 INTO DELTA (Δ) TABLE HB110
HB212
TRIGGER HB106 SENDS TRIGGER MESSAGE HB172 TO OPEN SERVER HB118
HB214
TO STEP HA206 FIG 94

FIG 96

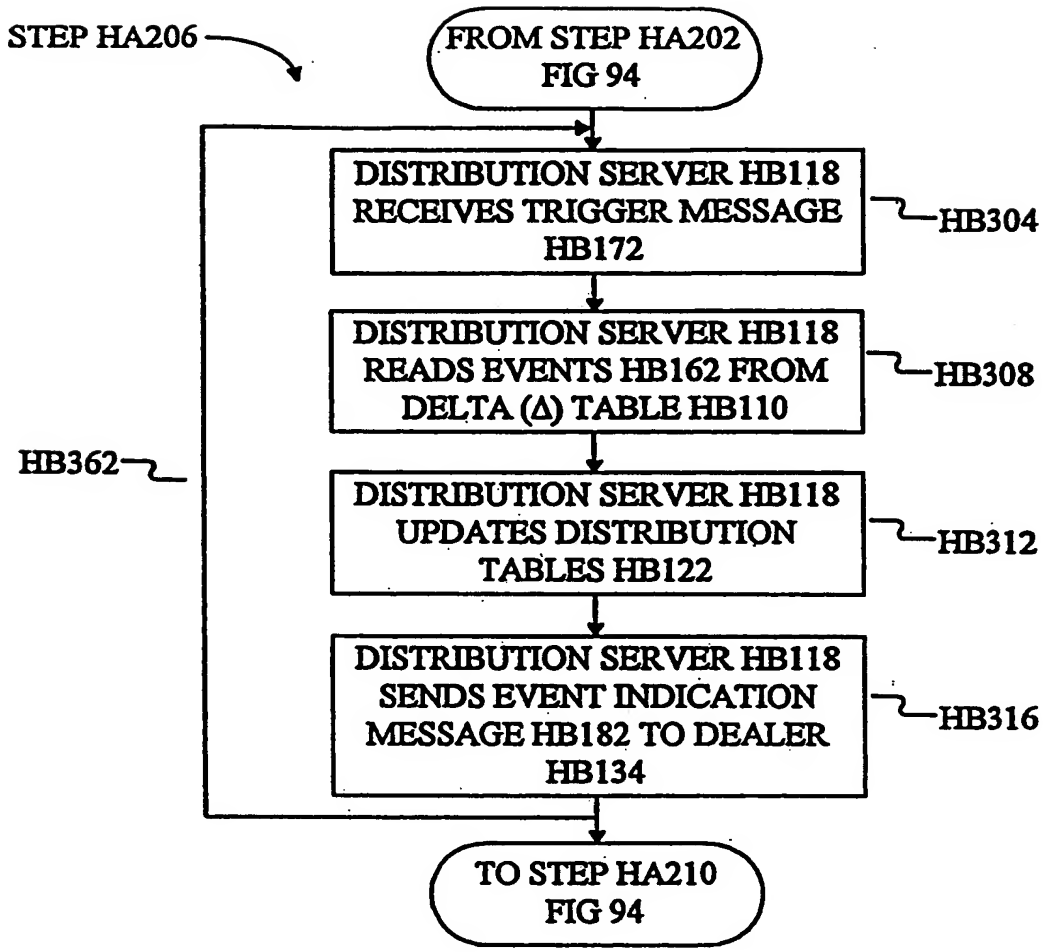

STEP HA206
FROM STEP HA202
FIG 94
DISTRIBUTION SERVER HB118 RECEIVES TRIGGER MESSAGE HB172
HB304
DISTRIBUTION SERVER HB118 READS EVENTS HB162 FROM DELTA (Δ) TABLE HB110
HB308
HB362
DISTRIBUTION SERVER HB118 UPDATES DISTRIBUTION TABLES HB122
HB312
DISTRIBUTION SERVER HB118 SENDS EVENT INDICATION MESSAGE HB182 TO DEALER HB134
HB316
TO STEP HA210
FIG 94

FIG 97

AUDIT TABLE HB126

SERVICE # HC104	SERVER NAME HC108	POINTER HC112	ACTION HC116	UPDATE FLAG HC120
SERVICE # HC104	SERVER NAME HC108	POINTER HC112	ACTION HC116	UPDATE FLAG HC120
SERVICE # HC104	SERVER NAME HC108	POINTER HC112	ACTION HC116	UPDATE FLAG HC120

FIG 98

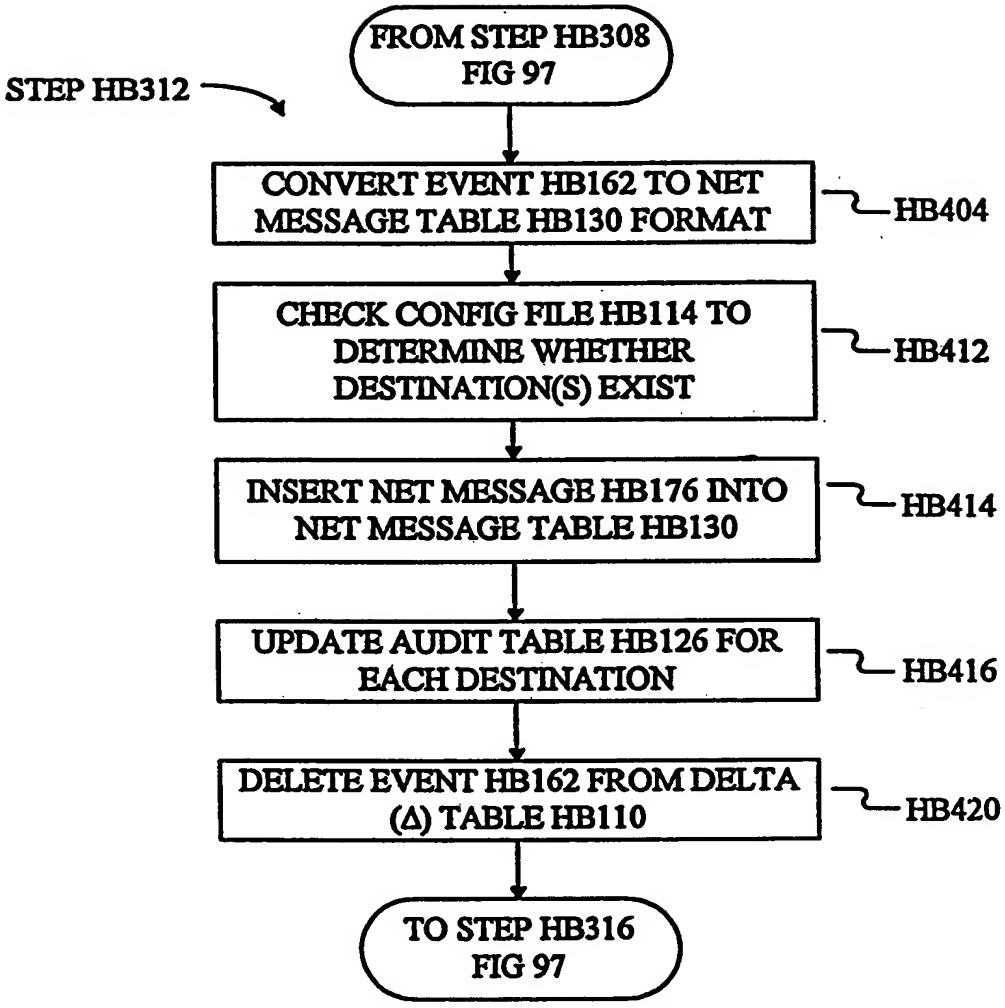

STEP HB312
FROM STEP HB308
FIG 97
CONVERT EVENT HB162 TO NET MESSAGE TABLE HB130 FORMAT
HB404
CHECK CONFIG FILE HB114 TO DETERMINE WHETHER DESTINATION(S) EXIST
HB412
INSERT NET MESSAGE HB176 INTO NET MESSAGE TABLE HB130
HB414
UPDATE AUDIT TABLE HB126 FOR EACH DESTINATION
HB416
DELETE EVENT HB162 FROM DELTA (Δ) TABLE HB110
HB420
TO STEP HB316
FIG 97

FIG 99

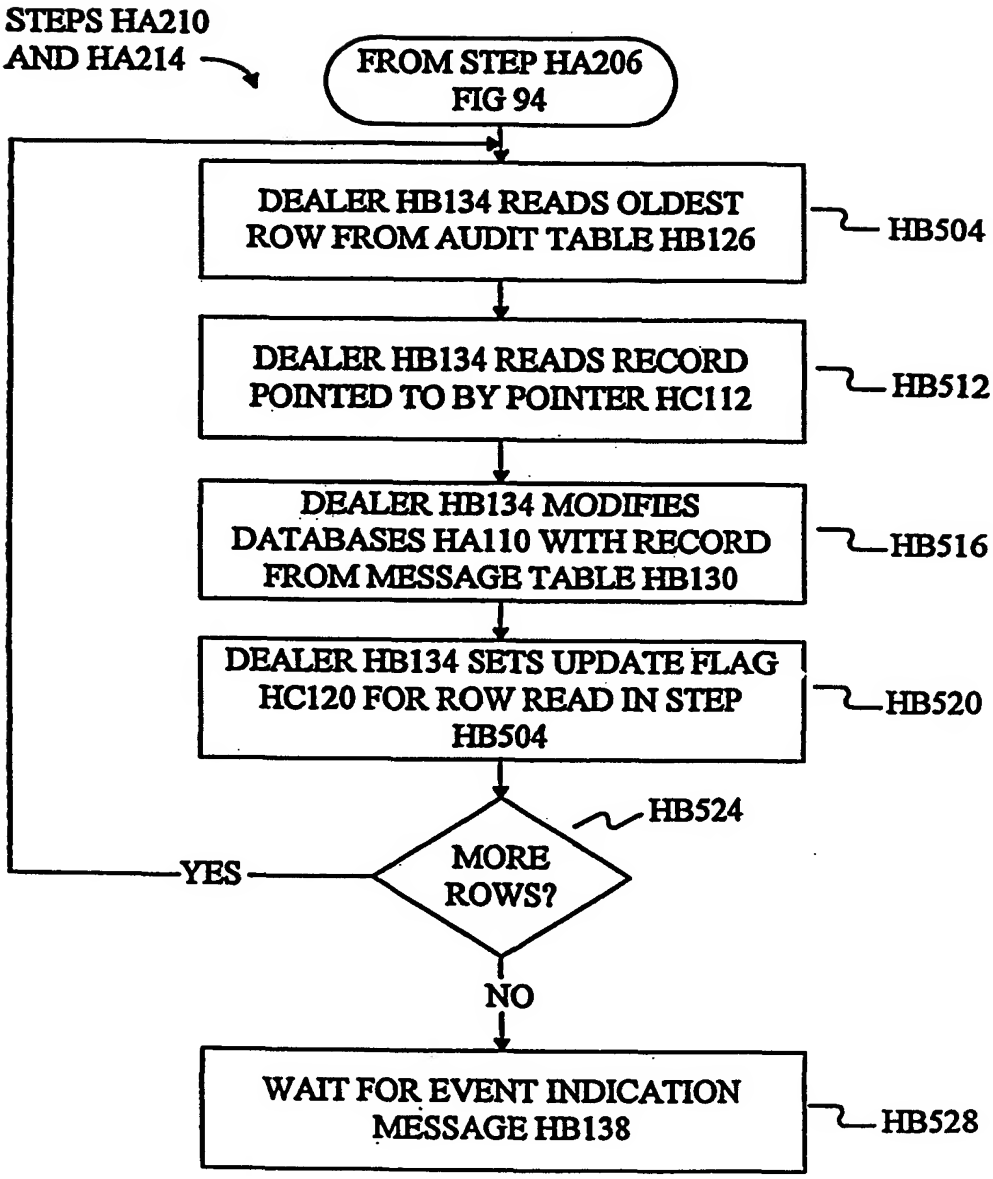

STEPS HA210
AND HA214
FROM STEP HA206
FIG 94
DEALER HB134 READS OLDEST ROW FROM AUDIT TABLE HB126
HB504
DEALER HB134 READS RECORD POINTED TO BY POINTER HC112
HB512
DEALER HB134 MODIFIES DATABASES HA110 WITH RECORD FROM MESSAGE TABLE HB130
HB516
DEALER HB134 SETS UPDATE FLAG HC120 FOR ROW READ IN STEP HB504
HB520
HB524
MORE ROWS?
YES
NO
WAIT FOR EVENT INDICATION MESSAGE HB138
HB528

FIG 100

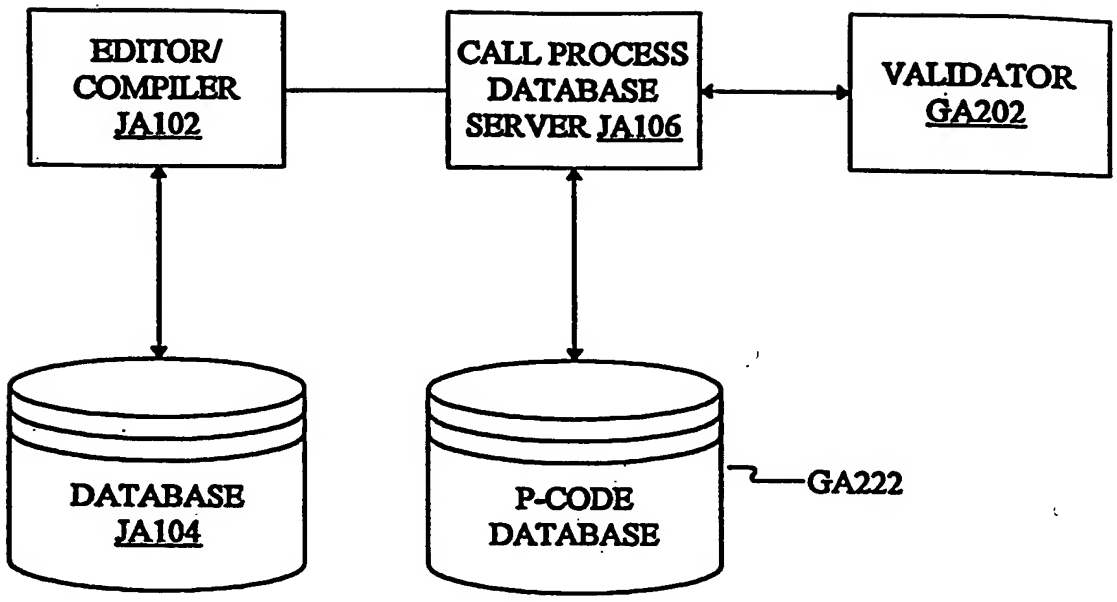

EDITOR/
COMPILER
JA102
CALL PROCESS
DATABASE
SERVER JA106
VALIDATOR
GA202
DATABASE
JA104
P-CODE
DATABASE
GA222

FIG 101

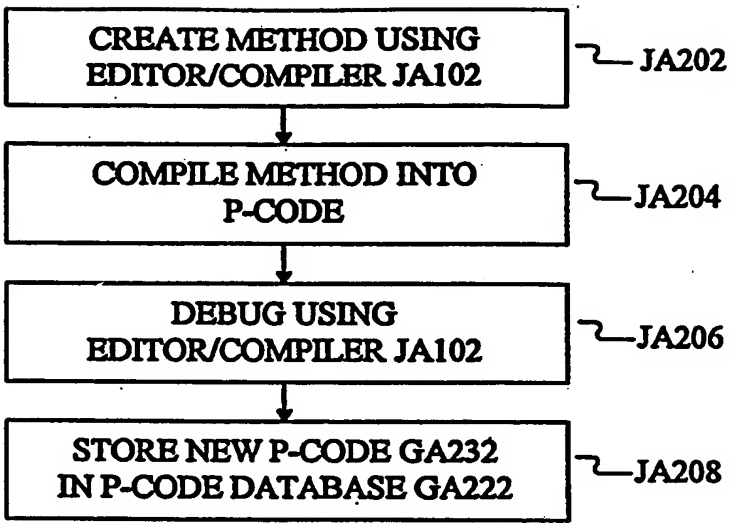

CREATE METHOD USING EDITOR/COMPILER JA102
JA202
COMPILE METHOD INTO P-CODE
JA204
DEBUG USING EDITOR/COMPILER JA102
JA206
STORE NEW P-CODE GA232 IN P-CODE DATABASE GA222
JA208

FIG 102

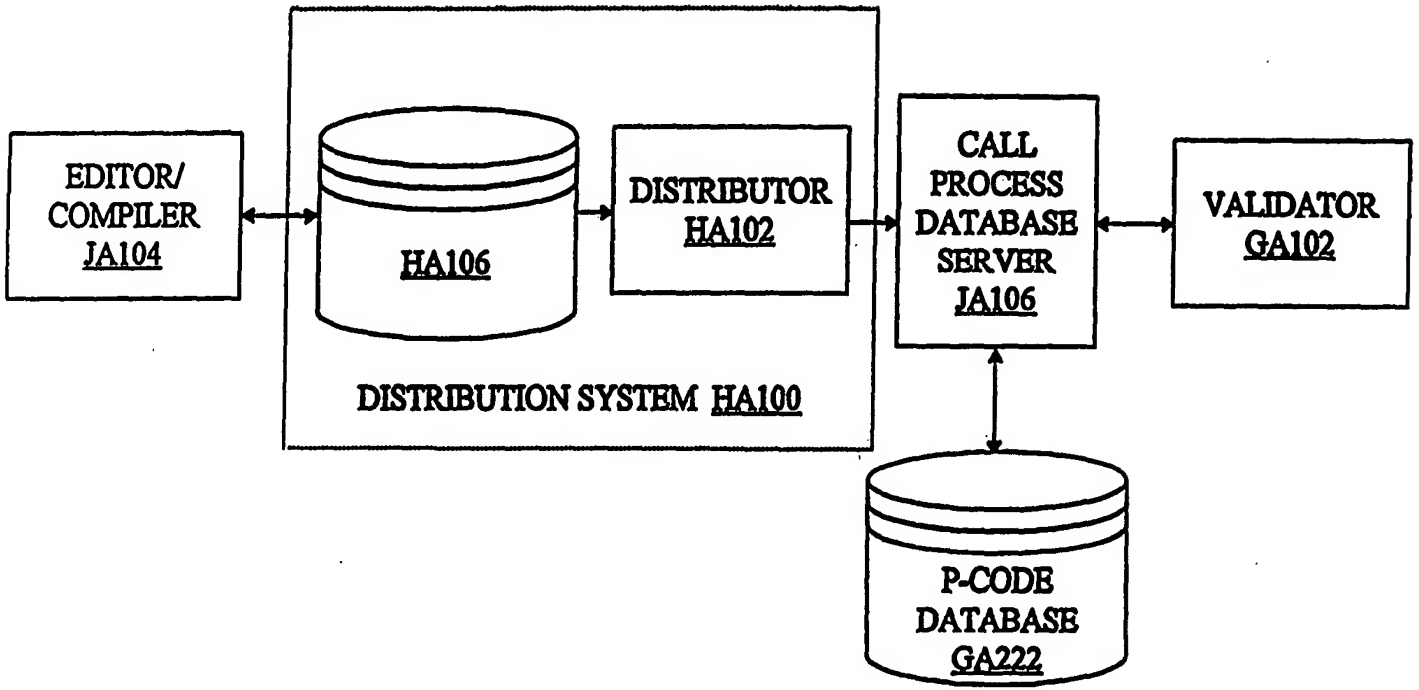

EDITOR/
COMPILER
JA104
HA106
DISTRIBUTOR
HA102
DISTRIBUTION SYSTEM HA100
CALL
PROCESS
DATABASE
SERVER
JA106
VALIDATOR
GA102
P-CODE
DATABASE
GA222

FIG 103

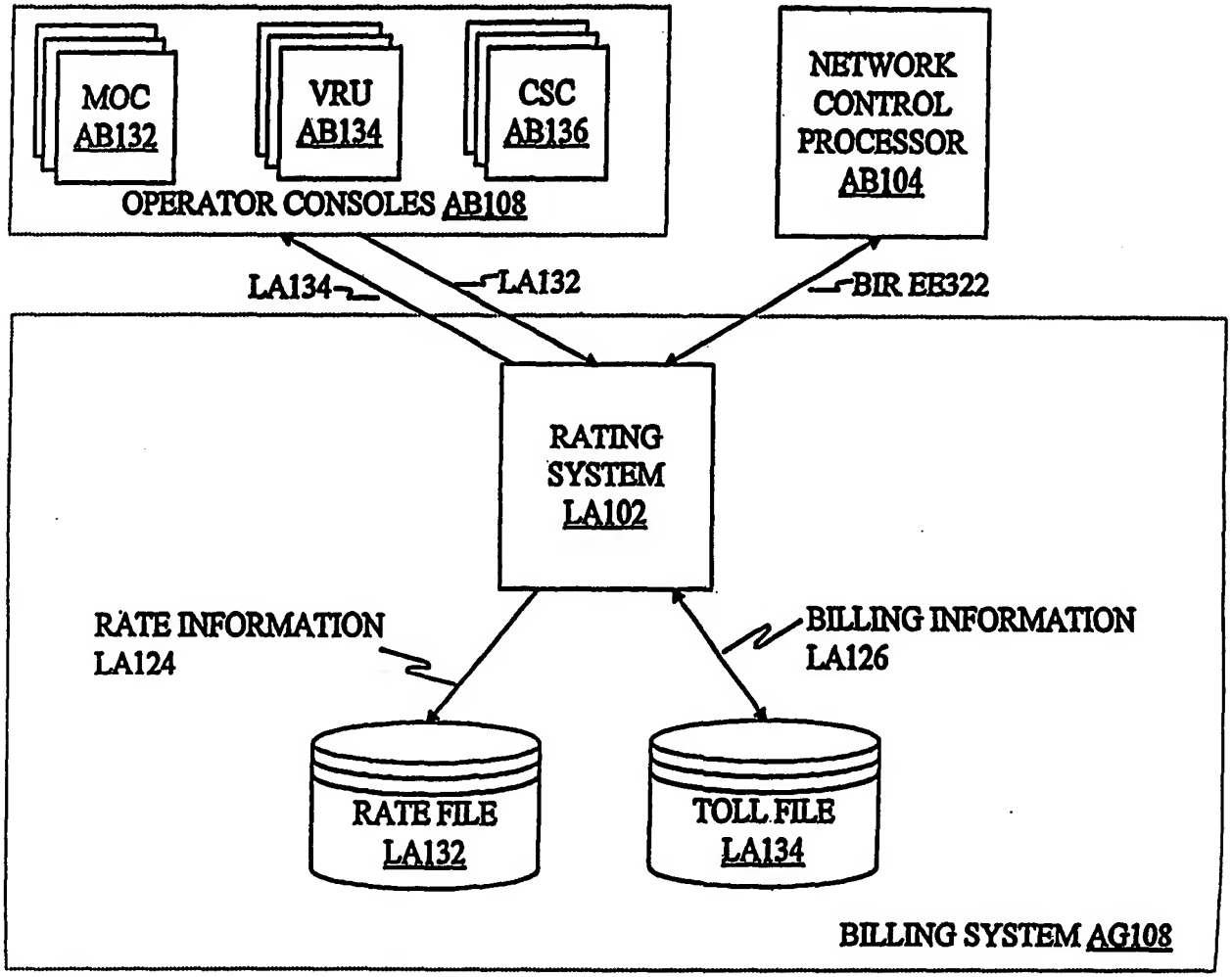

MOC
AB132
VRU
AB134
CSC
AB136
OPERATOR CONSOLES AB108
NETWORK
CONTROL
PROCESSOR
AB104
LA134
LA132
BIR EE322
RATING
SYSTEM
LA102
RATE INFORMATION
LA124
BILLING INFORMATION
LA126
RATE FILE
LA132
TOLL FILE
LA134
BILLING SYSTEM AG108

FIG 104

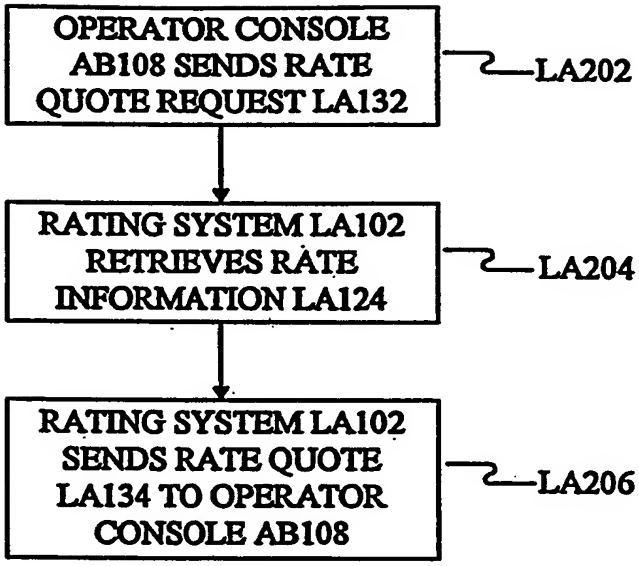

OPERATOR CONSOLE AB108 SENDS RATE QUOTE REQUEST LA132
LA202
RATING SYSTEM LA102 RETRIEVES RATE INFORMATION LA124
LA204
RATING SYSTEM LA102 SENDS RATE QUOTE LA134 TO OPERATOR CONSOLE AB108
LA206

FIG 105

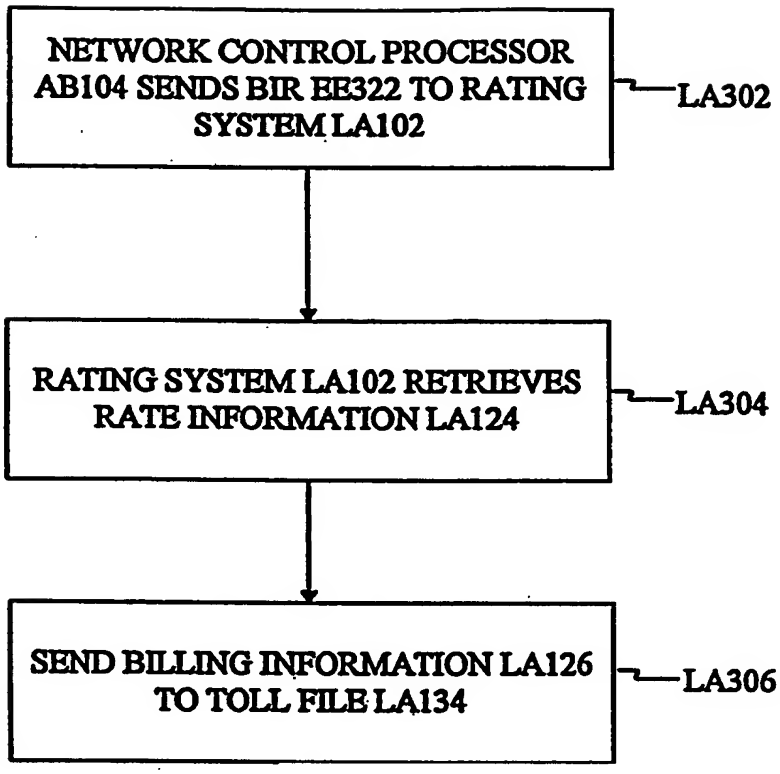

NETWORK CONTROL PROCESSOR AB104 SENDS BIR EE322 TO RATING SYSTEM LA102
LA302
RATING SYSTEM LA102 RETRIEVES RATE INFORMATION LA124
LA304
SEND BILLING INFORMATION LA126 TO TOLL FILE LA134
LA306

FIG 106

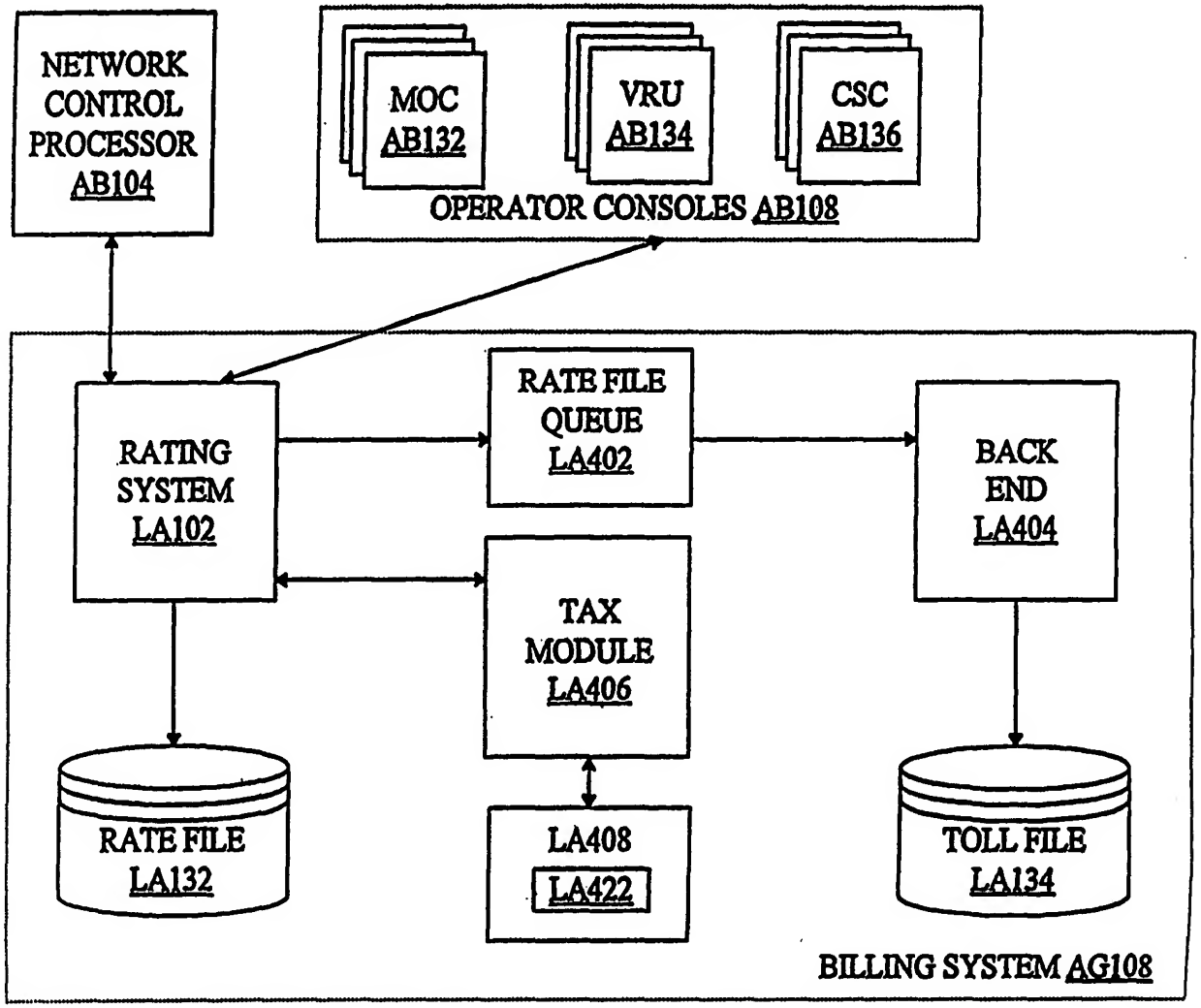

NETWORK CONTROL PROCESSOR AB104
MOC AB132
VRU AB134
CSC AB136
OPERATOR CONSOLES AB108
RATING SYSTEM LA102
RATE FILE QUEUE LA402
BACK END LA404
TAX MODULE LA406
RATE FILE LA132
LA408
LA422
TOLL FILE LA134
BILLING SYSTEM AG108

FIG 107

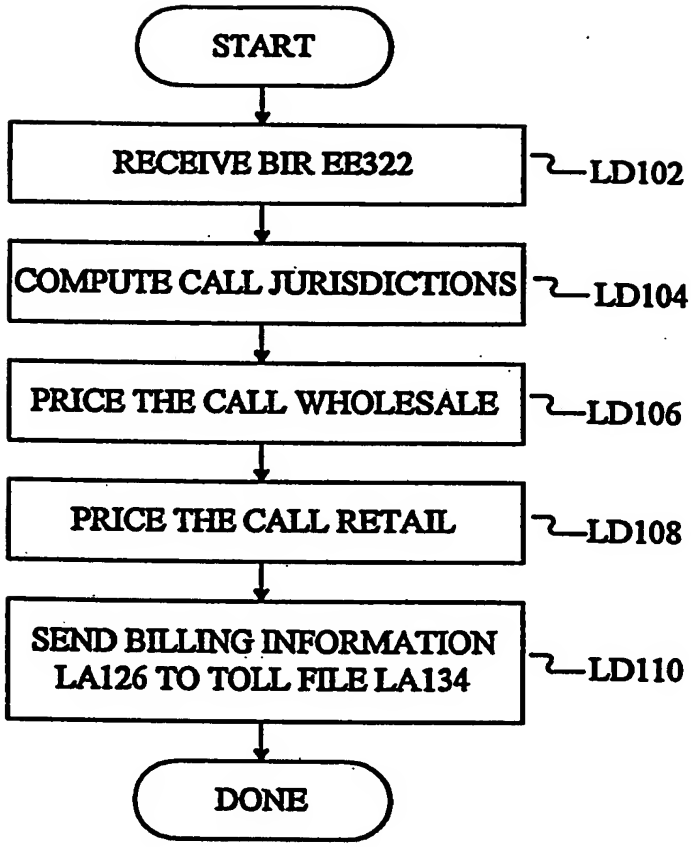

START
RECEIVE BIR EE322
LD102
COMPUTE CALL JURISDICTIONS
LD104
PRICE THE CALL WHOLESALE
LD106
PRICE THE CALL RETAIL
LD108
SEND BILLING INFORMATION LA126 TO TOLL FILE LA134
LD110
DONE

FIG 108

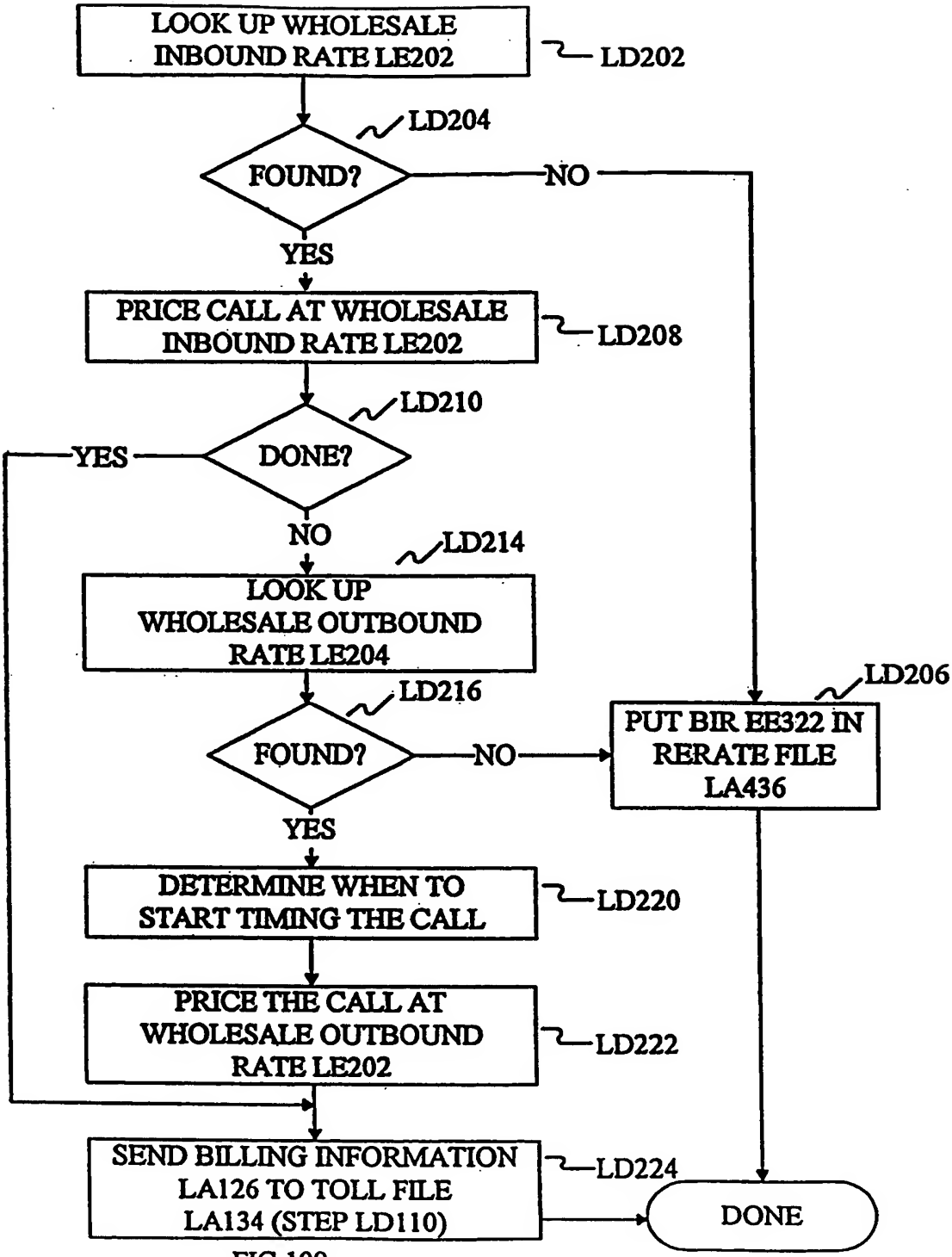

LOOK UP WHOLESALE INBOUND RATE LE202
LD202
LD204
FOUND?
NO
YES
PRICE CALL AT WHOLESALE INBOUND RATE LE202
LD208
LD210
DONE?
YES
NO
LD214
LOOK UP WHOLESALE OUTBOUND RATE LE204
LD216
FOUND?
NO
LD206
PUT BIR EE322 IN RERATE FILE LA436
YES
DETERMINE WHEN TO START TIMING THE CALL
LD220
PRICE THE CALL AT WHOLESALE OUTBOUND RATE LE202
LD222
SEND BILLING INFORMATION LA126 TO TOLL FILE LA134 (STEP LD110)
LD224
DONE

FIG 109

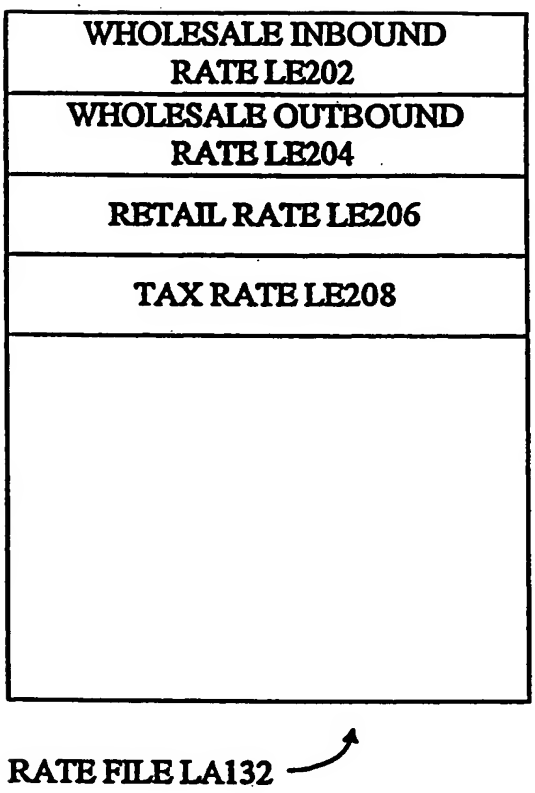

WHOLESALE INBOUND RATE LE202
WHOLESALE OUTBOUND RATE LE204
RETAIL RATE LE206
TAX RATE LE208
RATE FILE LA132

FIG 110

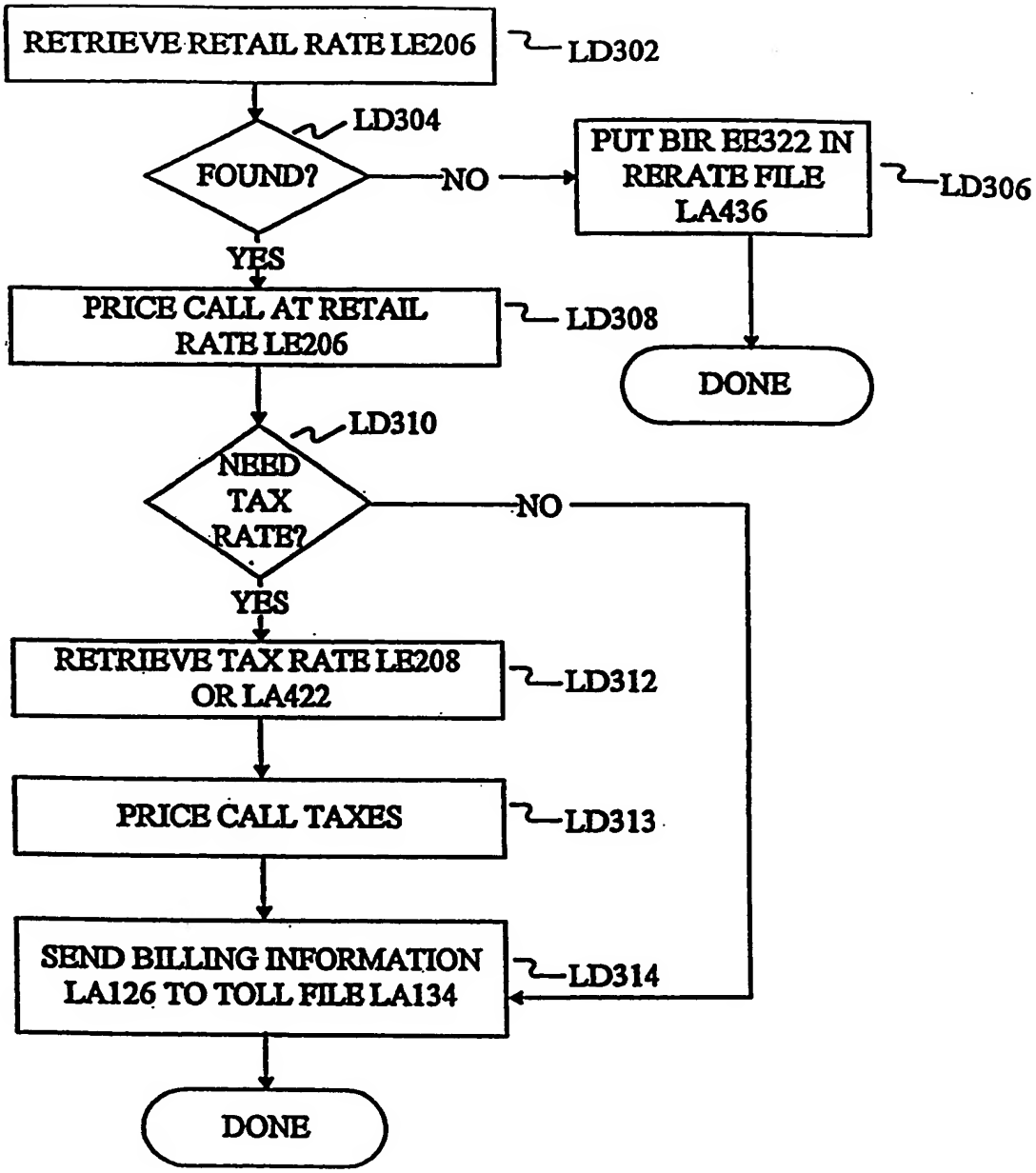

RETRIEVE RETAIL RATE LE206
LD302
LD304
FOUND?
NO
PUT BIR EE322 IN RERATE FILE LA436
LD306
YES
PRICE CALL AT RETAIL RATE LE206
LD308
DONE
LD310
NEED TAX RATE?
NO
YES
RETRIEVE TAX RATE LE208 OR LA422
LD312
PRICE CALL TAXES
LD313
SEND BILLING INFORMATION LA126 TO TOLL FILE LA134
LD314
DONE

FIG 111

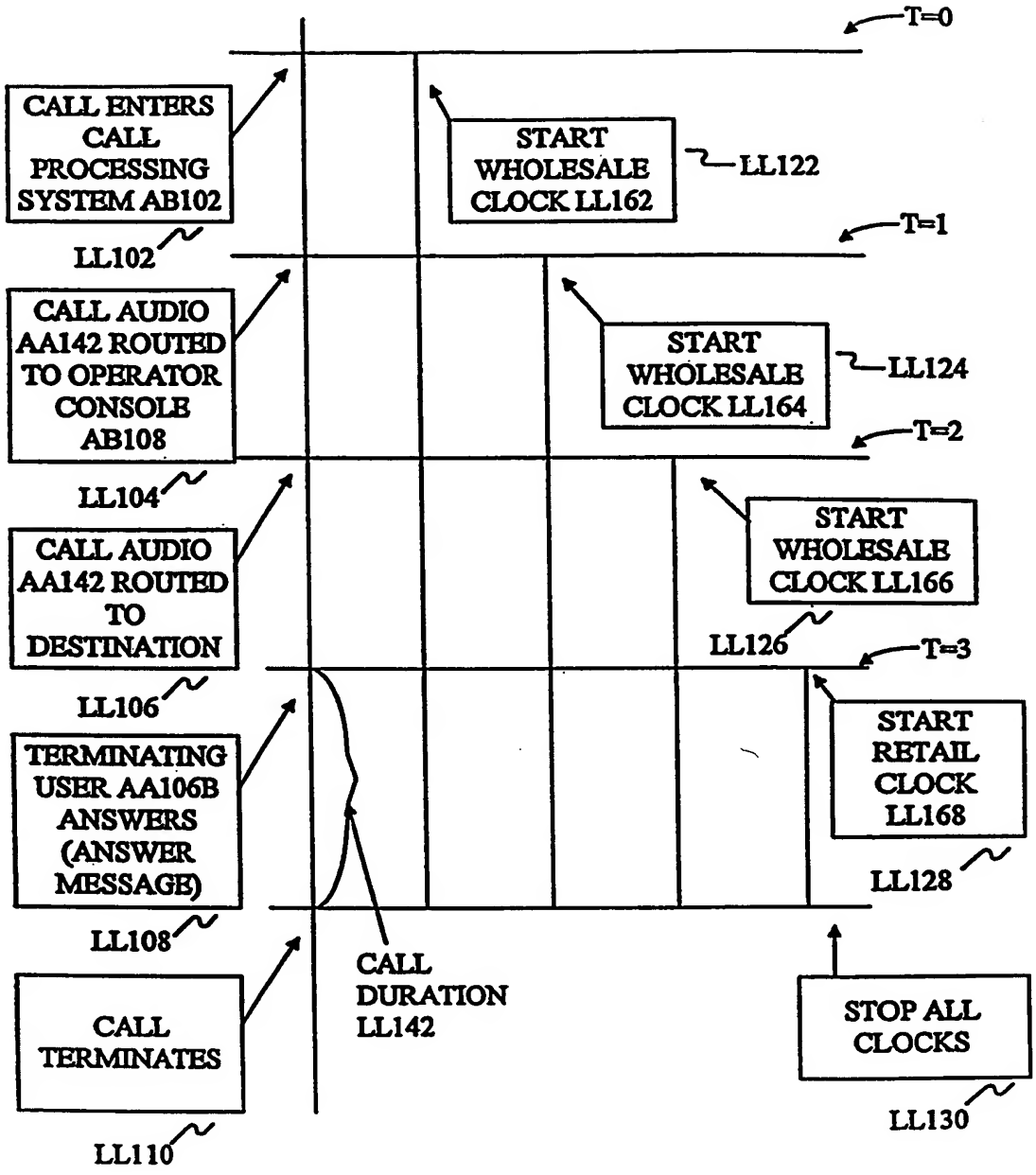

T=0
CALL ENTERS CALL PROCESSING SYSTEM AB102
LL102
START WHOLESALE CLOCK LL162
LL122
T=1
CALL AUDIO AA142 ROUTED TO OPERATOR CONSOLE AB108
LL104
START WHOLESALE CLOCK LL164
LL124
T=2
CALL AUDIO AA142 ROUTED TO DESTINATION
LL106
START WHOLESALE CLOCK LL166
LL126
T=3
TERMINATING USER AA106B ANSWERS (ANSWER MESSAGE)
LL108
START RETAIL CLOCK LL168
LL128
CALL DURATION LL142
CALL TERMINATES
LL110
STOP ALL CLOCKS
LL130

FIG 112

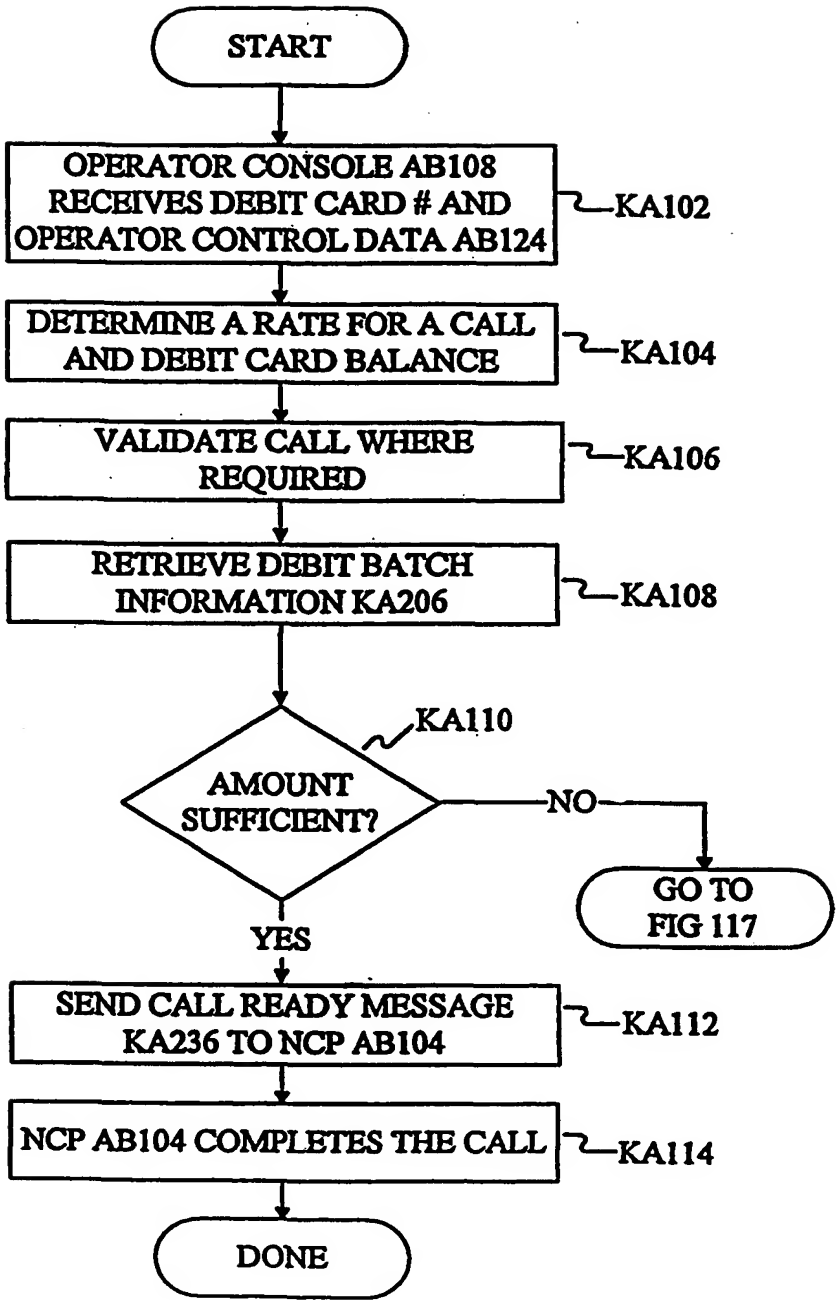

START
OPERATOR CONSOLE AB108 RECEIVES DEBIT CARD # AND OPERATOR CONTROL DATA AB124
KA102
DETERMINE A RATE FOR A CALL AND DEBIT CARD BALANCE
KA104
VALIDATE CALL WHERE REQUIRED
KA106
RETRIEVE DEBIT BATCH INFORMATION KA206
KA108
KA110
AMOUNT SUFFICIENT?
NO
GO TO FIG 117
YES
SEND CALL READY MESSAGE KA236 TO NCP AB104
KA112
NCP AB104 COMPLETES THE CALL
KA114
DONE

FIG 113

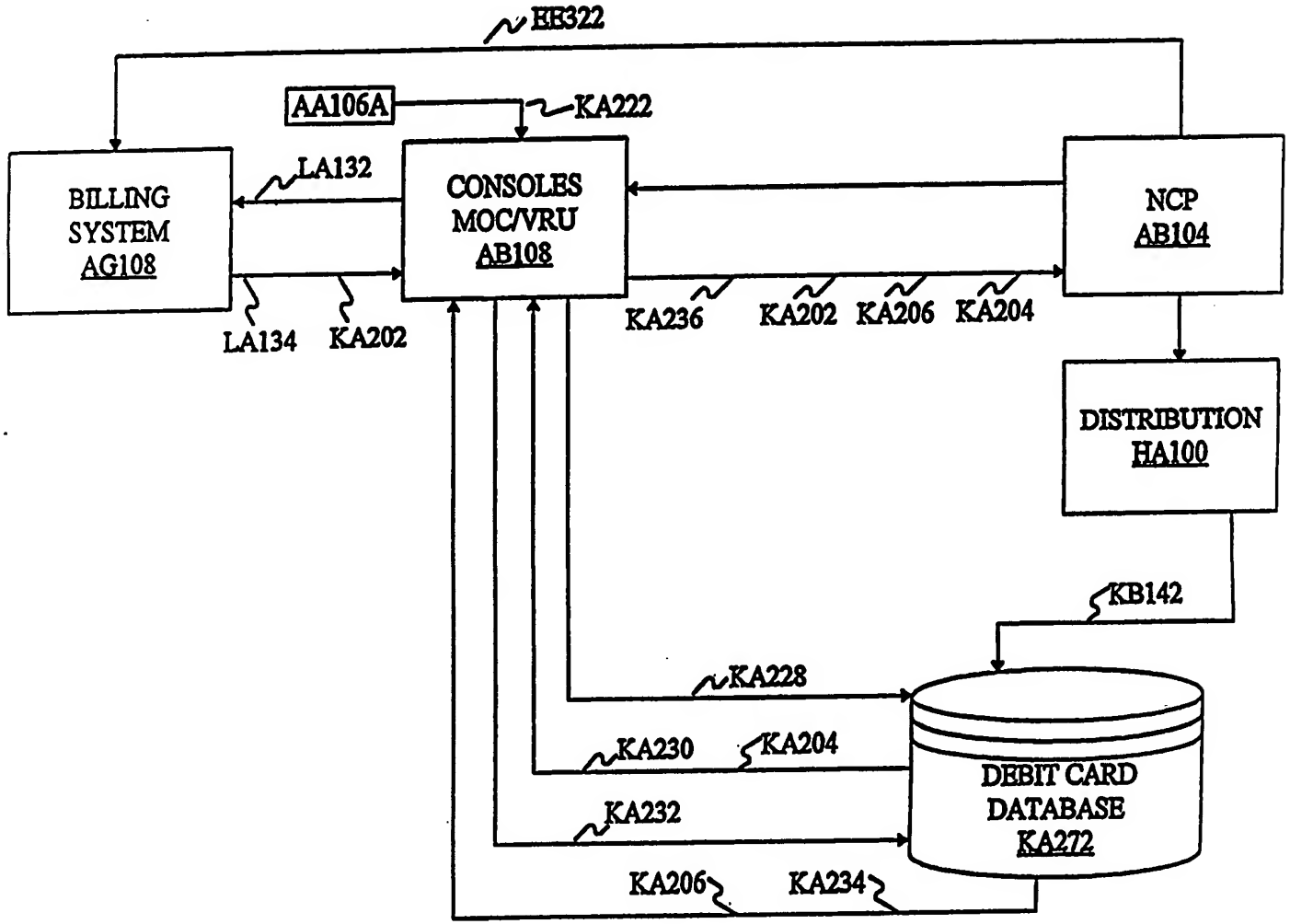

EE322
AA106A
KA222
BILLING SYSTEM AG108
LA132
CONSOLES MOC/VRU AB108
NCP AB104
LA134
KA202
KA236
KA202
KA206
KA204
DISTRIBUTION HA100
KB142
KA228
KA230
KA204
DEBIT CARD DATABASE KA272
KA232
KA206
KA234

FIG 114

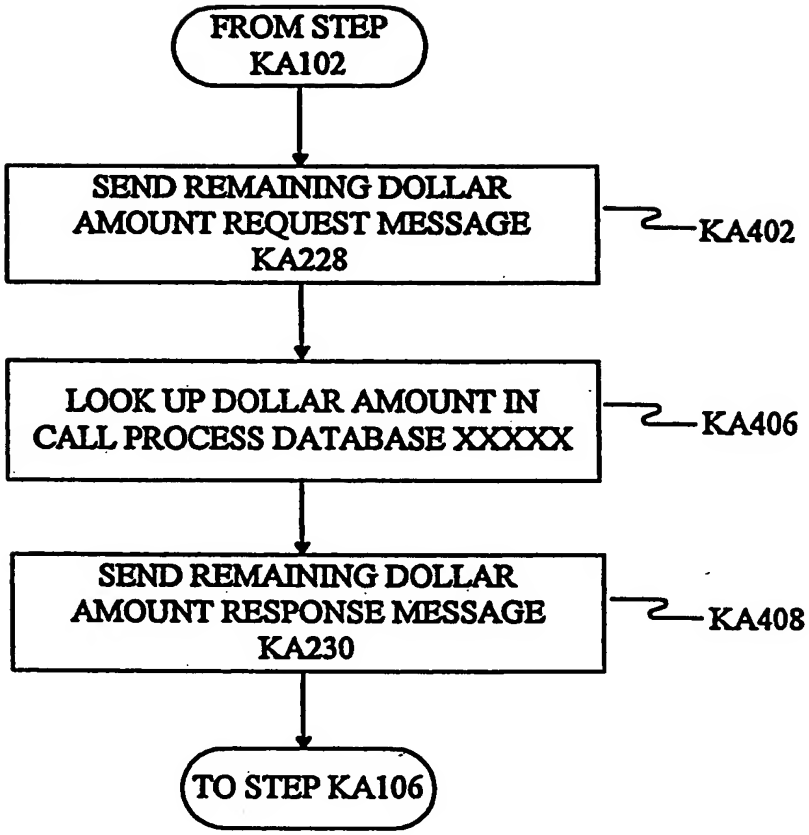

FROM STEP KA102
SEND REMAINING DOLLAR AMOUNT REQUEST MESSAGE KA228
KA402
LOOK UP DOLLAR AMOUNT IN CALL PROCESS DATABASE XXXXX
KA406
SEND REMAINING DOLLAR AMOUNT RESPONSE MESSAGE KA230
KA408
TO STEP KA106

FIG 115

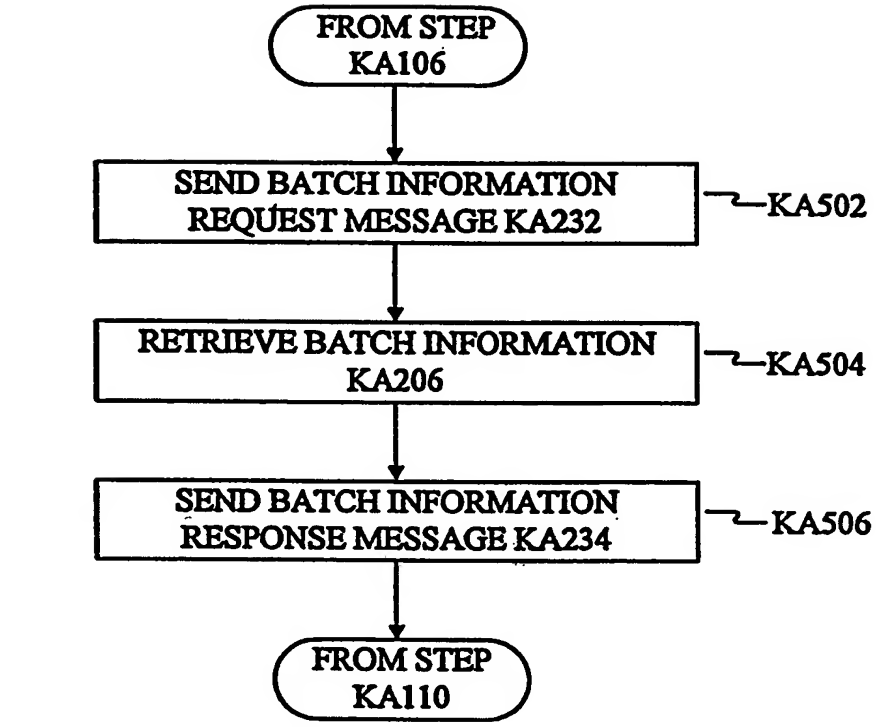

FROM STEP KA106
SEND BATCH INFORMATION REQUEST MESSAGE KA232
KA502
RETRIEVE BATCH INFORMATION KA206
KA504
SEND BATCH INFORMATION RESPONSE MESSAGE KA234
KA506
FROM STEP KA110
STEP KA108

FIG 116

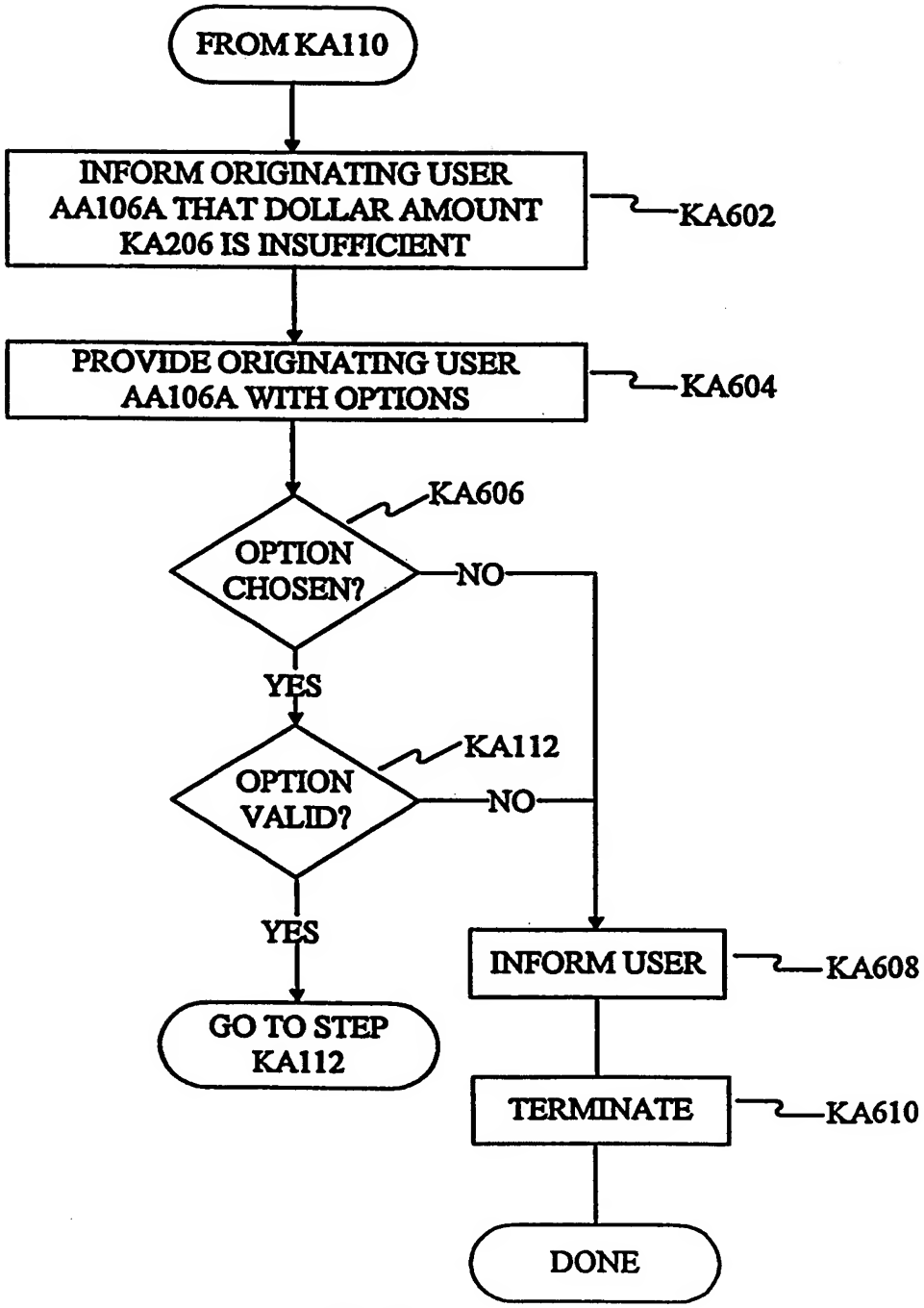

FROM KA110
INFORM ORIGINATING USER AA106A THAT DOLLAR AMOUNT KA206 IS INSUFFICIENT
KA602
PROVIDE ORIGINATING USER AA106A WITH OPTIONS
KA604
KA606
OPTION CHOSEN?
NO
YES
KA112
OPTION VALID?
NO
YES
INFORM USER
KA608
GO TO STEP KA112
TERMINATE
KA610
DONE

FIG 117

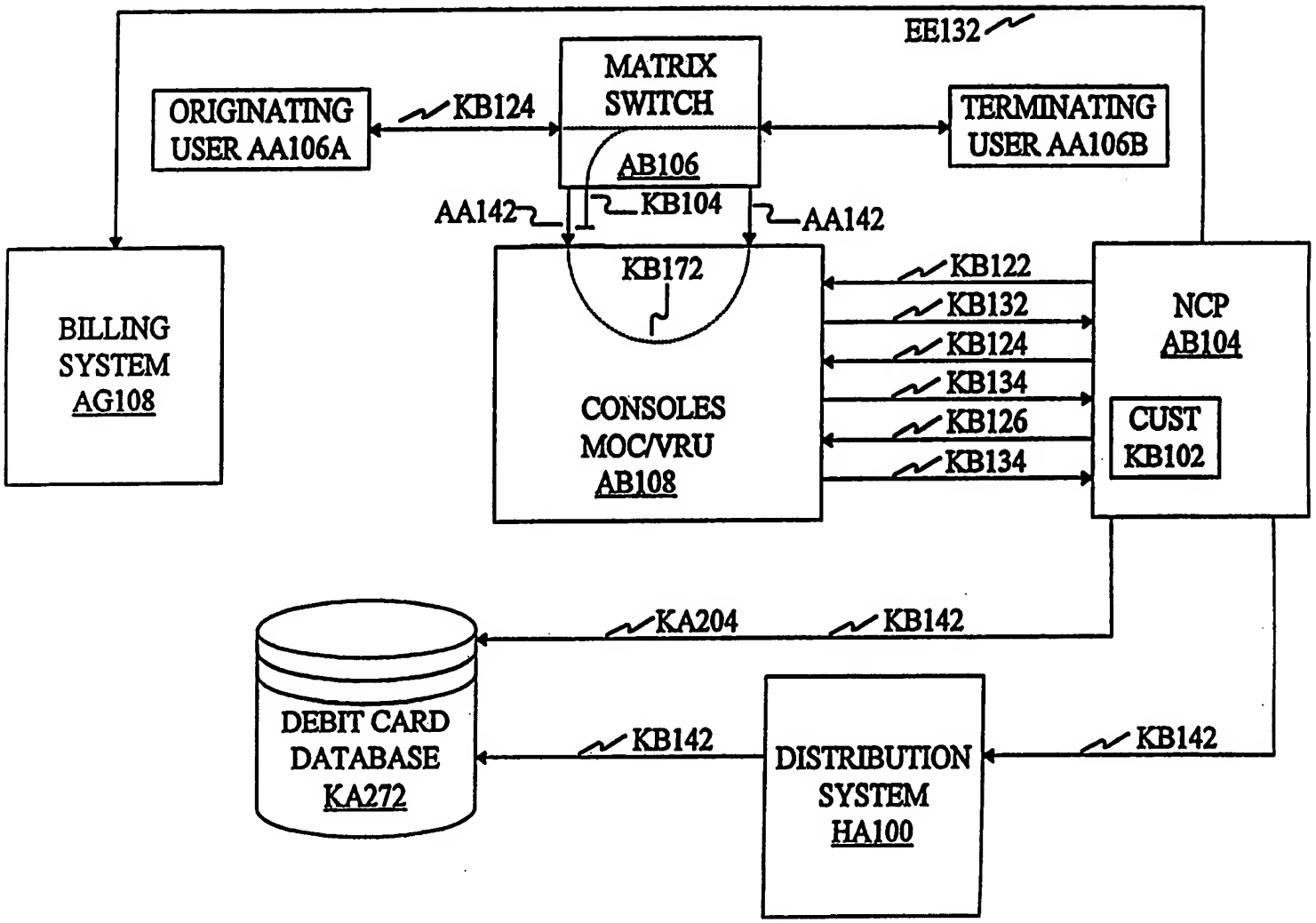

EE132
MATRIX SWITCH
AB106
ORIGINATING USER AA106A
KB124
TERMINATING USER AA106B
AA142
KB104
AA142
KB172
BILLING SYSTEM AG108
CONSOLES MOC/VRU AB108
KB122
KB132
KB124
KB134
KB126
KB134
NCP AB104
CUST KB102
KA204
KB142
DEBIT CARD DATABASE KA272
KB142
DISTRIBUTION SYSTEM HA100
KB142

FIG 118

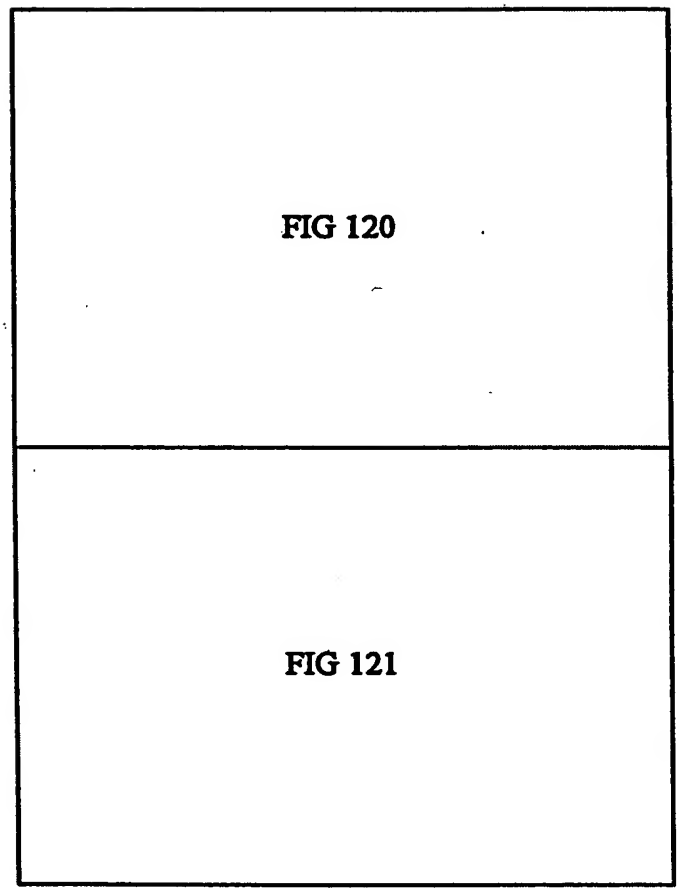


FIG 120

FIG 121

FIG 119

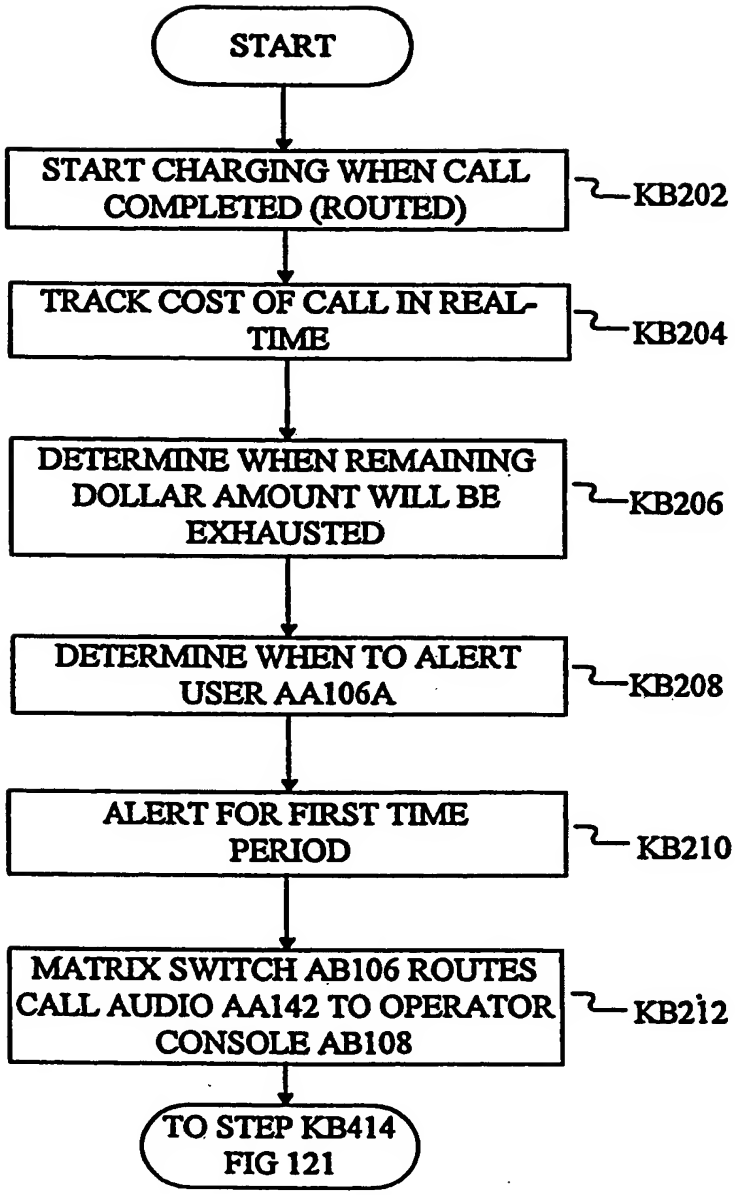

START
START CHARGING WHEN CALL COMPLETED (ROUTED)
KB202
TRACK COST OF CALL IN REAL-TIME
KB204
DETERMINE WHEN REMAINING DOLLAR AMOUNT WILL BE EXHAUSTED
KB206
DETERMINE WHEN TO ALERT USER AA106A
KB208
ALERT FOR FIRST TIME PERIOD
KB210
MATRIX SWITCH AB106 ROUTES CALL AUDIO AA142 TO OPERATOR CONSOLE AB108
KB212
TO STEP KB414 FIG 121

FIG 120

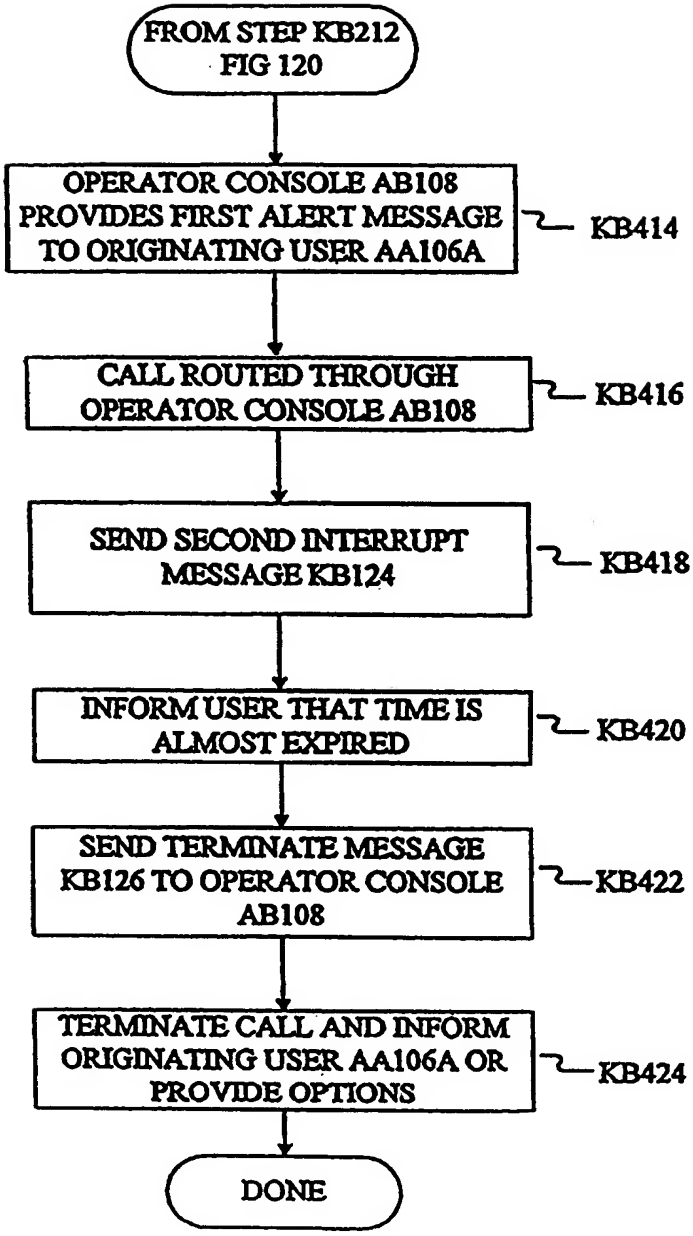

FROM STEP KB212
FIG 120
OPERATOR CONSOLE AB108 PROVIDES FIRST ALERT MESSAGE TO ORIGINATING USER AA106A
KB414
CALL ROUTED THROUGH OPERATOR CONSOLE AB108
KB416
SEND SECOND INTERRUPT MESSAGE KB124
KB418
INFORM USER THAT TIME IS ALMOST EXPIRED
KB420
SEND TERMINATE MESSAGE KB126 TO OPERATOR CONSOLE AB108
KB422
TERMINATE CALL AND INFORM ORIGINATING USER AA106A OR PROVIDE OPTIONS
KB424
DONE

FIG 121

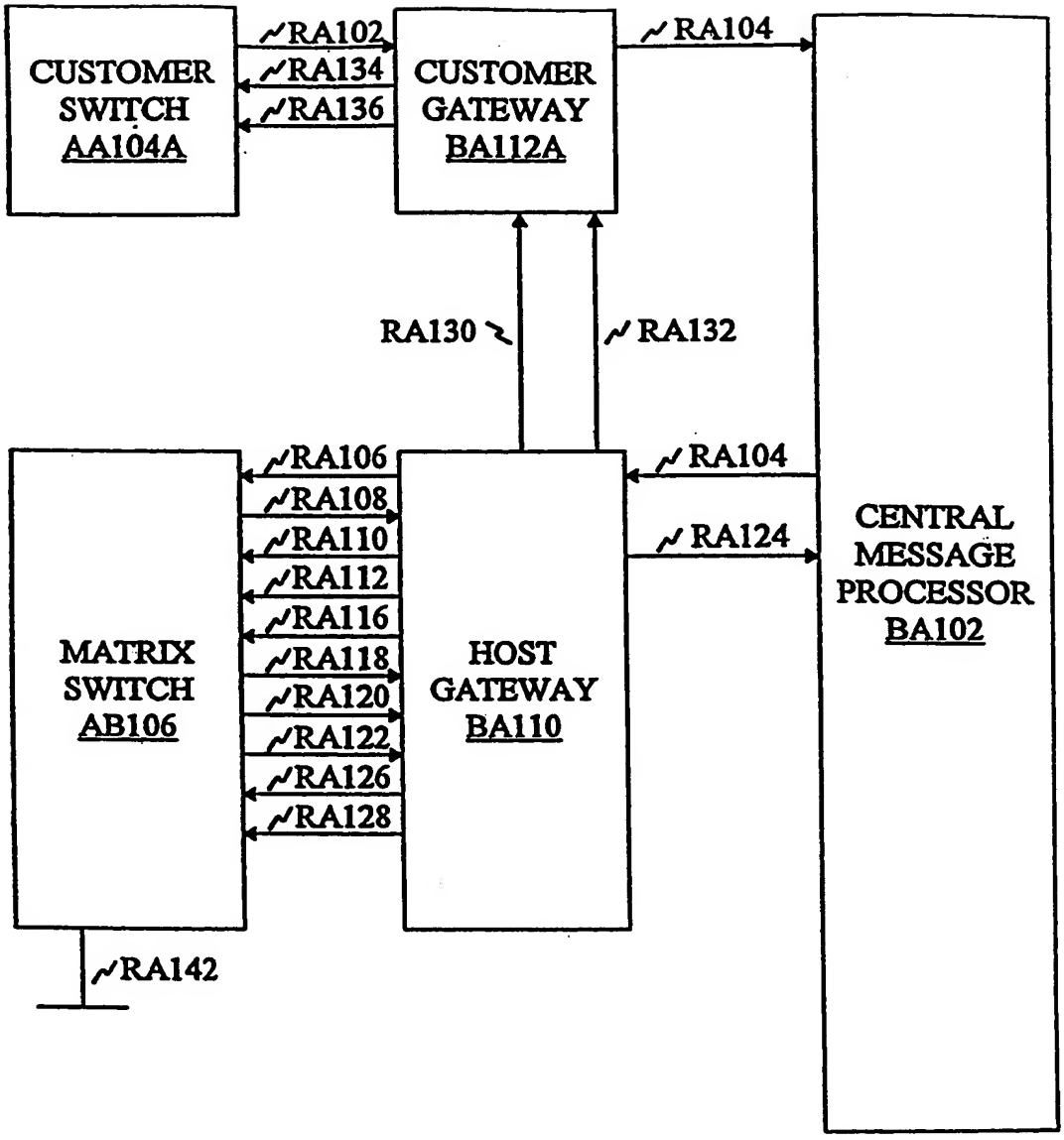

CUSTOMER SWITCH AA104A
RA102
RA134
RA136
CUSTOMER GATEWAY BA112A
RA104
RA130
RA132
RA106
RA108
RA110
RA112
RA116
RA118
RA120
RA122
RA126
RA128
RA104
RA124
MATRIX SWITCH AB106
HOST GATEWAY BA110
CENTRAL MESSAGE PROCESSOR BA102
RA142

FIG 122

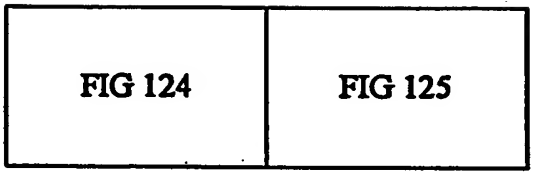


FIG 123

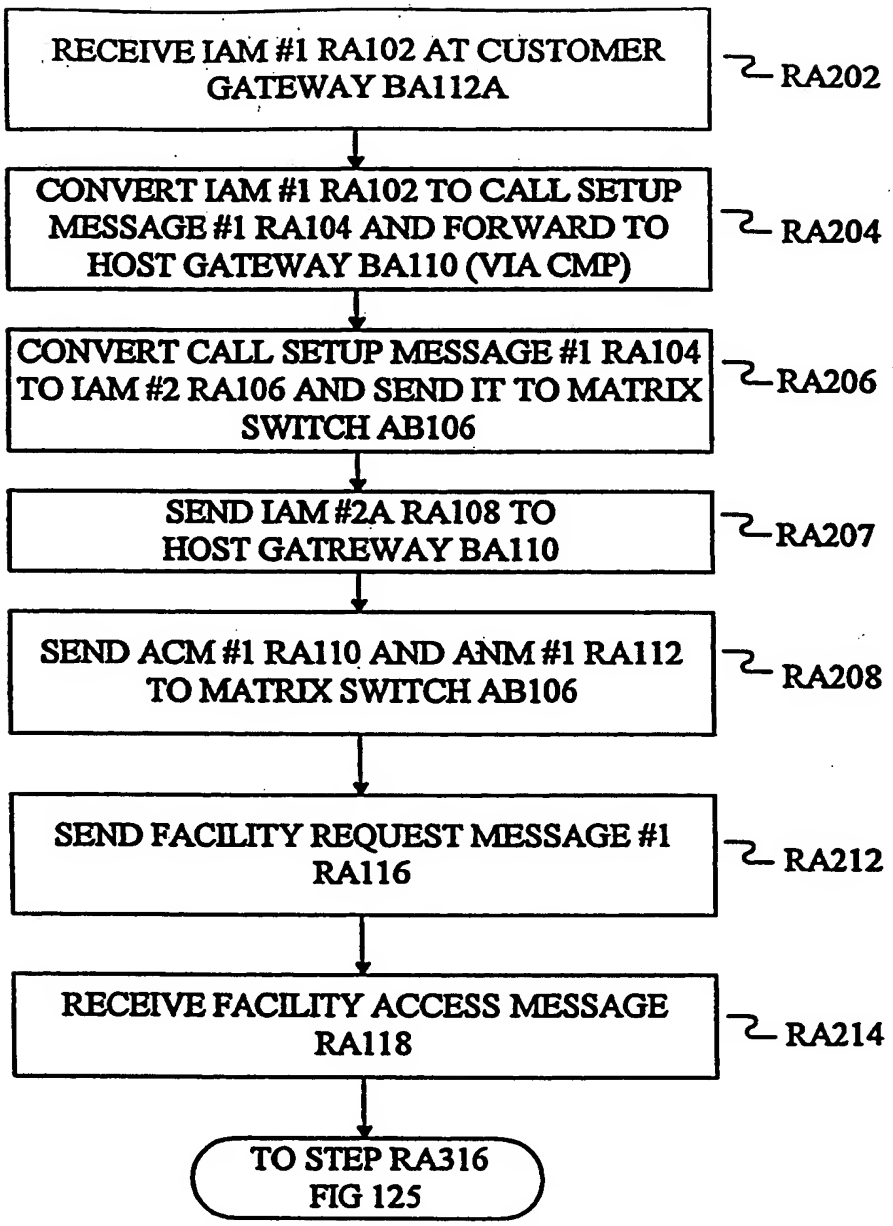

RECEIVE IAM #1 RA102 AT CUSTOMER GATEWAY BA112A
RA202
CONVERT IAM #1 RA102 TO CALL SETUP MESSAGE #1 RA104 AND FORWARD TO HOST GATEWAY BA110 (VIA CMP)
RA204
CONVERT CALL SETUP MESSAGE #1 RA104 TO IAM #2 RA106 AND SEND IT TO MATRIX SWITCH AB106
RA206
SEND IAM #2A RA108 TO HOST GATREWAY BA110
RA207
SEND ACM #1 RA110 AND ANM #1 RA112 TO MATRIX SWITCH AB106
RA208
SEND FACILITY REQUEST MESSAGE #1 RA116
RA212
RECEIVE FACILITY ACCESS MESSAGE RA118
RA214
TO STEP RA316 FIG 125

FIG 124

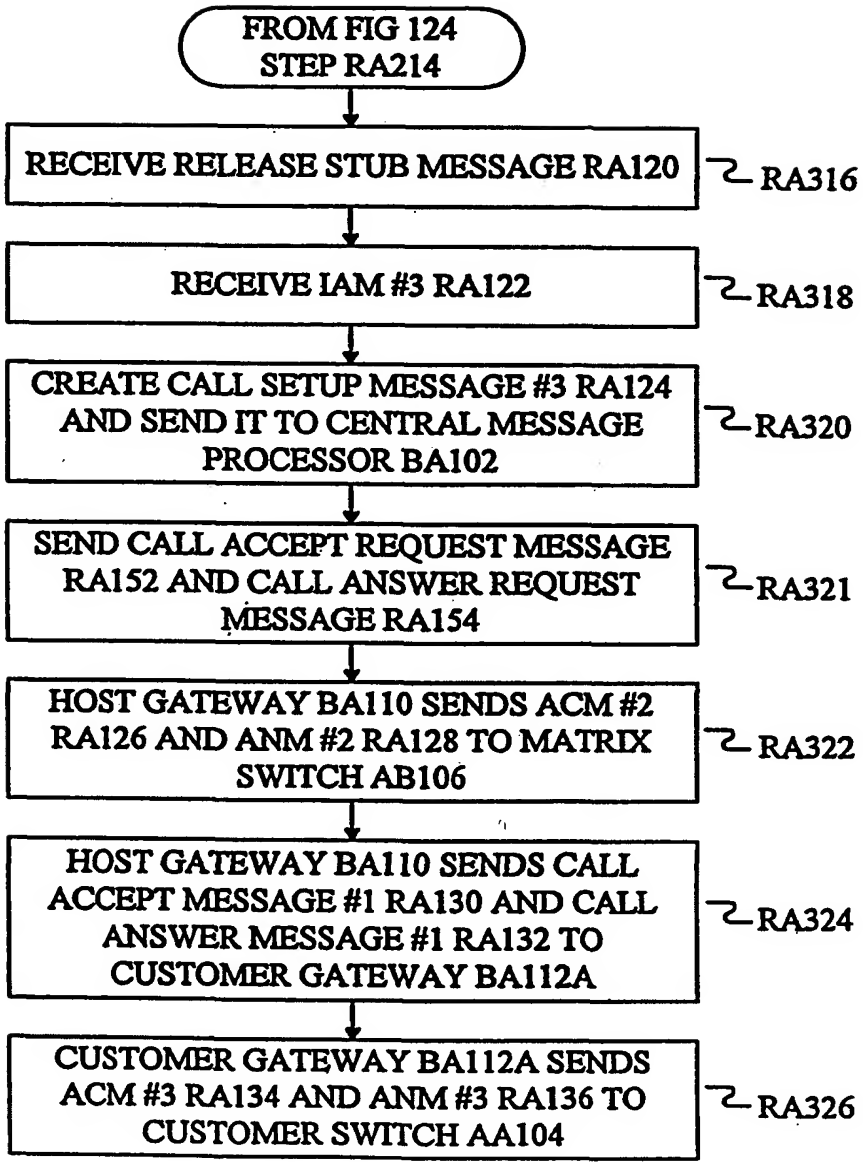

FROM FIG 124
STEP RA214
RECEIVE RELEASE STUB MESSAGE RA120
RA316
RECEIVE IAM #3 RA122
RA318
CREATE CALL SETUP MESSAGE #3 RA124 AND SEND IT TO CENTRAL MESSAGE PROCESSOR BA102
RA320
SEND CALL ACCEPT REQUEST MESSAGE RA152 AND CALL ANSWER REQUEST MESSAGE RA154
RA321
HOST GATEWAY BA110 SENDS ACM #2 RA126 AND ANM #2 RA128 TO MATRIX SWITCH AB106
RA322
HOST GATEWAY BA110 SENDS CALL ACCEPT MESSAGE #1 RA130 AND CALL ANSWER MESSAGE #1 RA132 TO CUSTOMER GATEWAY BA112A
RA324
CUSTOMER GATEWAY BA112A SENDS ACM #3 RA134 AND ANM #3 RA136 TO CUSTOMER SWITCH AA104
RA326

FIG 125

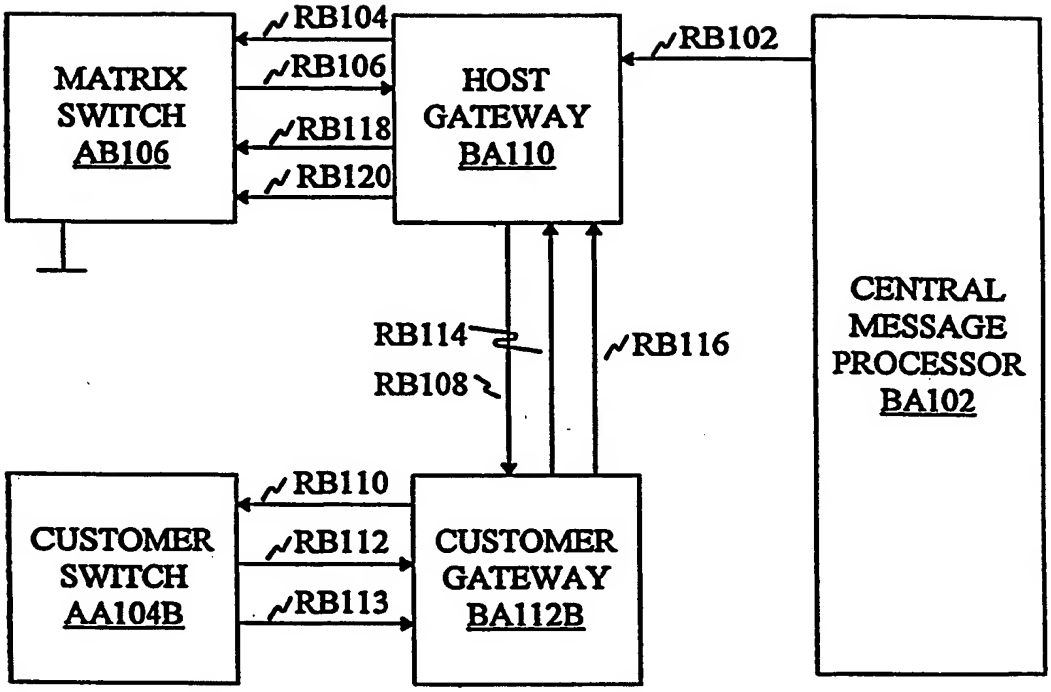

MATRIX SWITCH AB106
RB104
RB106
RB118
RB120
HOST GATEWAY BA110
RB102
CENTRAL MESSAGE PROCESSOR BA102
RB114
RB108
RB116
CUSTOMER SWITCH AA104B
RB110
RB112
RB113
CUSTOMER GATEWAY BA112B

FIG 126

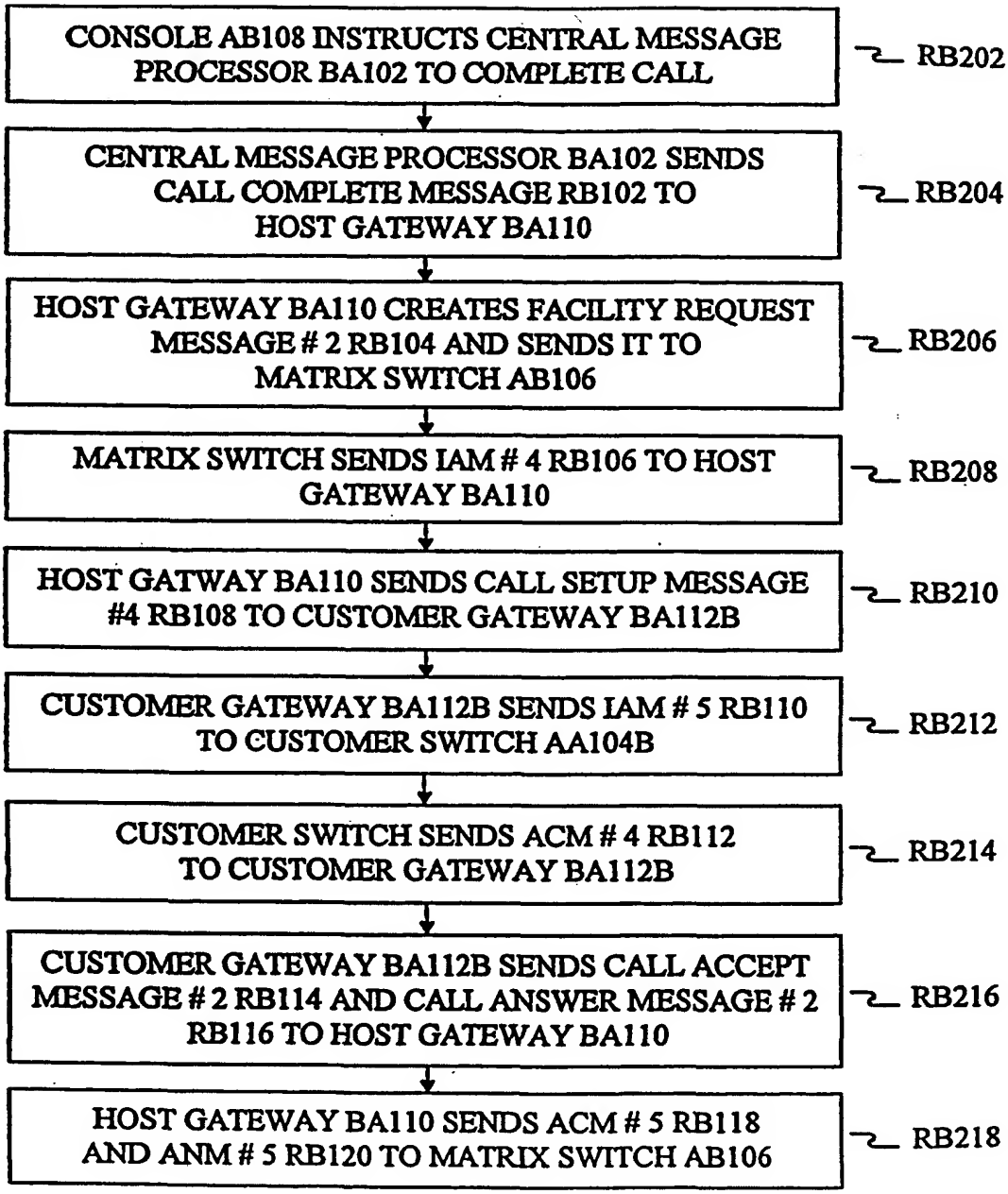

CONSOLE AB108 INSTRUCTS CENTRAL MESSAGE PROCESSOR BA102 TO COMPLETE CALL
RB202
CENTRAL MESSAGE PROCESSOR BA102 SENDS CALL COMPLETE MESSAGE RB102 TO HOST GATEWAY BA110
RB204
HOST GATEWAY BA110 CREATES FACILITY REQUEST MESSAGE # 2 RB104 AND SENDS IT TO MATRIX SWITCH AB106
RB206
MATRIX SWITCH SENDS IAM # 4 RB106 TO HOST GATEWAY BA110
RB208
HOST GATWAY BA110 SENDS CALL SETUP MESSAGE #4 RB108 TO CUSTOMER GATEWAY BA112B
RB210
CUSTOMER GATEWAY BA112B SENDS IAM # 5 RB110 TO CUSTOMER SWITCH AA104B
RB212
CUSTOMER SWITCH SENDS ACM # 4 RB112 TO CUSTOMER GATEWAY BA112B
RB214
CUSTOMER GATEWAY BA112B SENDS CALL ACCEPT MESSAGE # 2 RB114 AND CALL ANSWER MESSAGE # 2 RB116 TO HOST GATEWAY BA110
RB216
HOST GATEWAY BA110 SENDS ACM # 5 RB118 AND ANM # 5 RB120 TO MATRIX SWITCH AB106
RB218

FIG 127

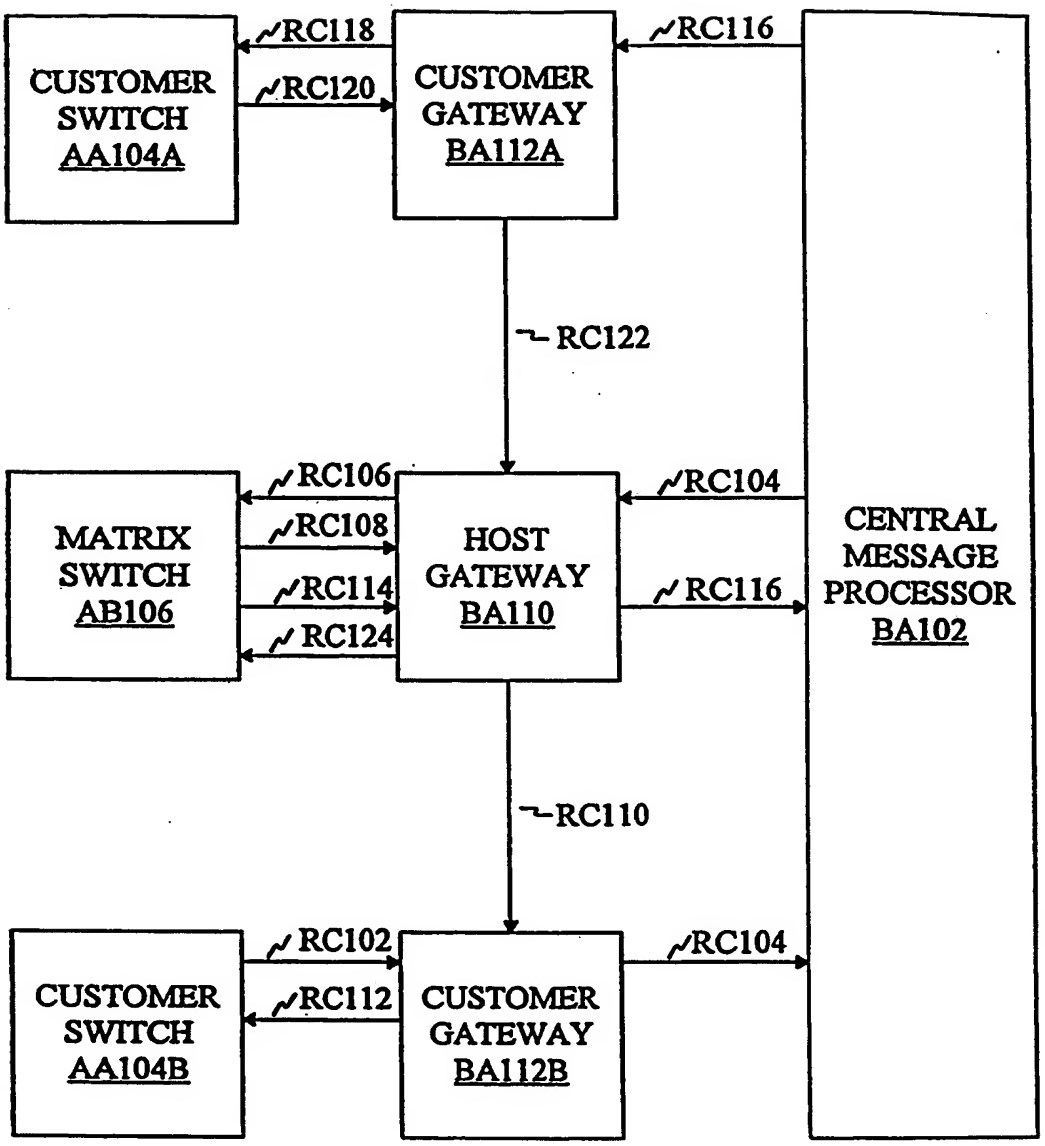

CUSTOMER SWITCH AA104A
RC118
RC120
CUSTOMER GATEWAY BA112A
RC116
RC122
MATRIX SWITCH AB106
RC106
RC108
RC114
RC124
HOST GATEWAY BA110
RC104
RC116
CENTRAL MESSAGE PROCESSOR BA102
RC110
CUSTOMER SWITCH AA104B
RC102
RC112
CUSTOMER GATEWAY BA112B
RC104

FIG 128

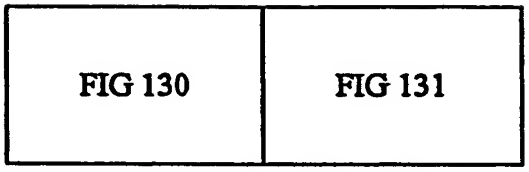


FIG 129

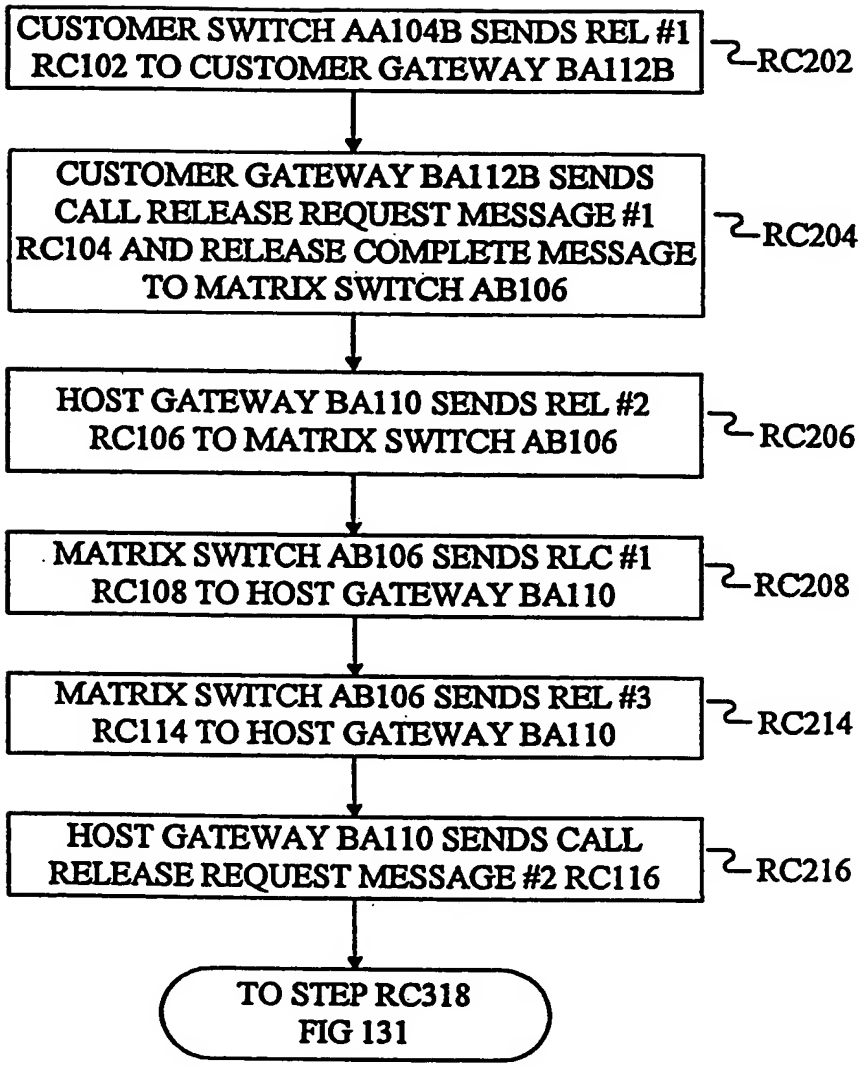

CUSTOMER SWITCH AA104B SENDS REL #1 RC102 TO CUSTOMER GATEWAY BA112B
RC202
CUSTOMER GATEWAY BA112B SENDS CALL RELEASE REQUEST MESSAGE #1 RC104 AND RELEASE COMPLETE MESSAGE TO MATRIX SWITCH AB106
RC204
HOST GATEWAY BA110 SENDS REL #2 RC106 TO MATRIX SWITCH AB106
RC206
MATRIX SWITCH AB106 SENDS RLC #1 RC108 TO HOST GATEWAY BA110
RC208
MATRIX SWITCH AB106 SENDS REL #3 RC114 TO HOST GATEWAY BA110
RC214
HOST GATEWAY BA110 SENDS CALL RELEASE REQUEST MESSAGE #2 RC116
RC216
TO STEP RC318 FIG 131

FIG 130

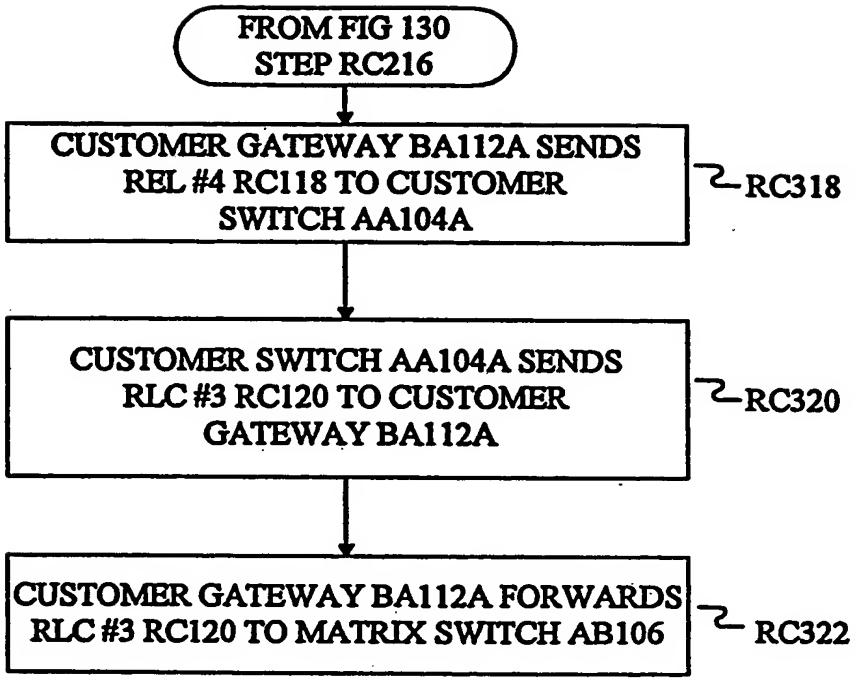

FROM FIG 130
STEP RC216
CUSTOMER GATEWAY BA112A SENDS REL #4 RC118 TO CUSTOMER SWITCH AA104A
RC318
CUSTOMER SWITCH AA104A SENDS RLC #3 RC120 TO CUSTOMER GATEWAY BA112A
RC320
CUSTOMER GATEWAY BA112A FORWARDS RLC #3 RC120 TO MATRIX SWITCH AB106
RC322

FIG 131

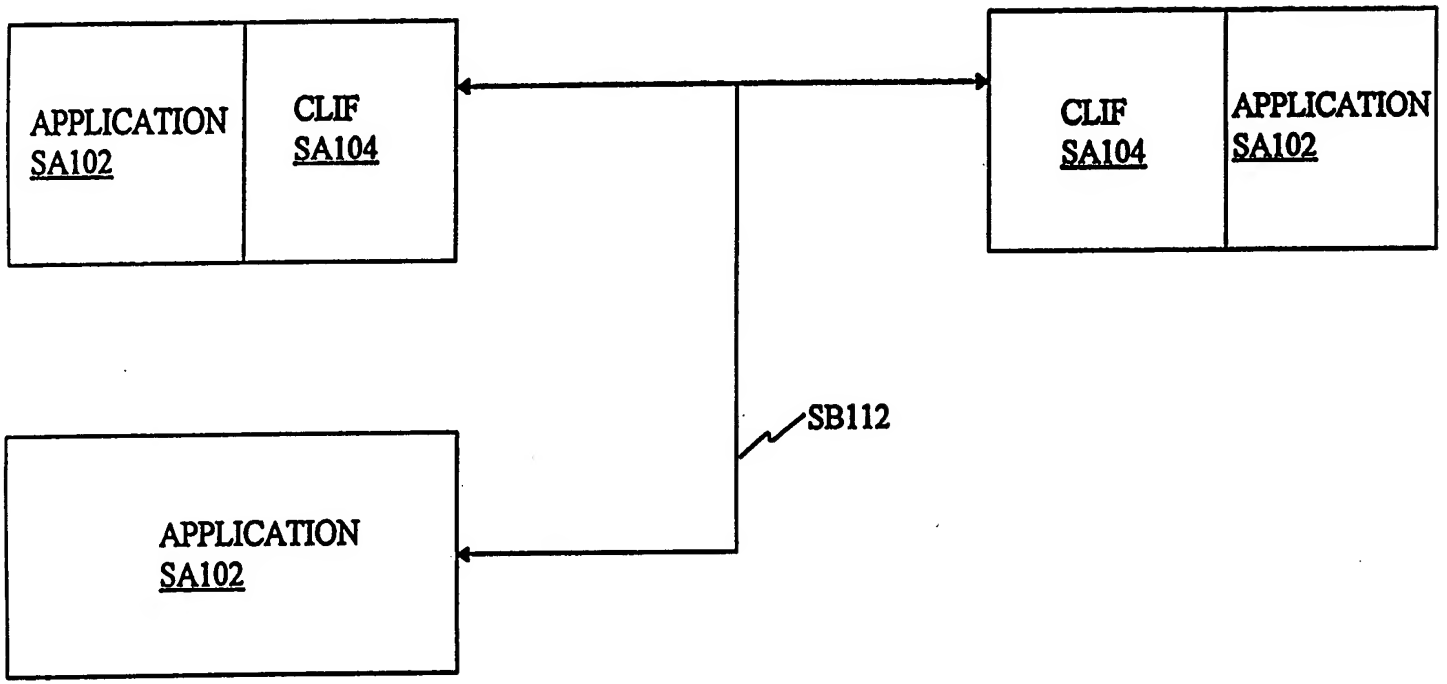

APPLICATION
SA102
CLIF
SA104
CLIF
SA104
APPLICATION
SA102
SB112
APPLICATION
SA102

FIG 132

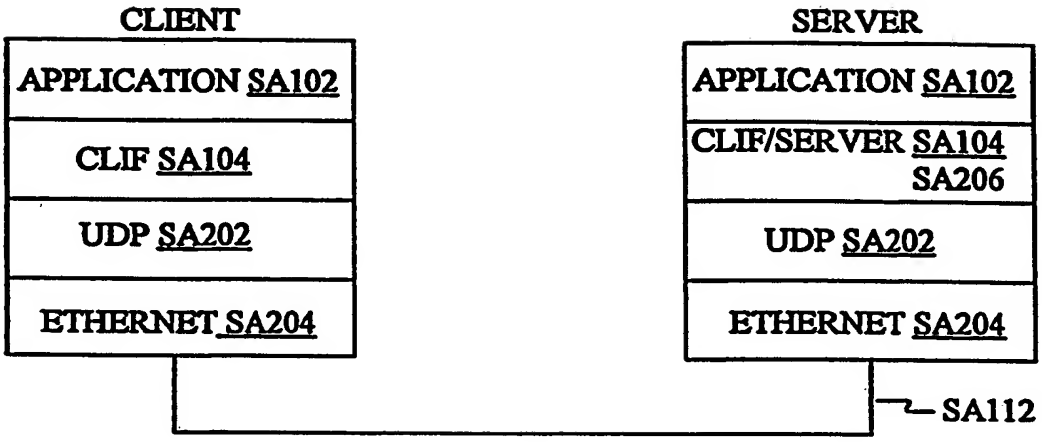

CLIENT
APPLICATION SA102
CLIF SA104
UDP SA202
ETHERNET SA204
SERVER
APPLICATION SA102
CLIF/SERVER SA104
SA206
UDP SA202
ETHERNET SA204
SA112

FIG 133

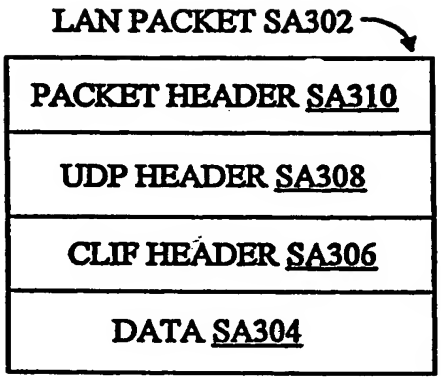

LAN PACKET SA302
PACKET HEADER SA310
UDP HEADER SA308
CLIF HEADER SA306
DATA SA304

FIG 134

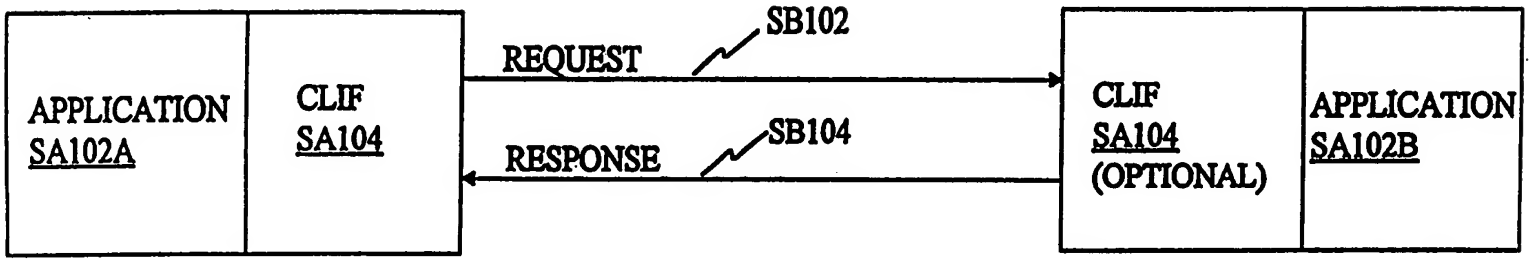

APPLICATION
SA102A
CLIF
SA104
REQUEST
SB102
RESPONSE
SB104
CLIF
SA104
(OPTIONAL)
APPLICATION
SA102B

FIG 135

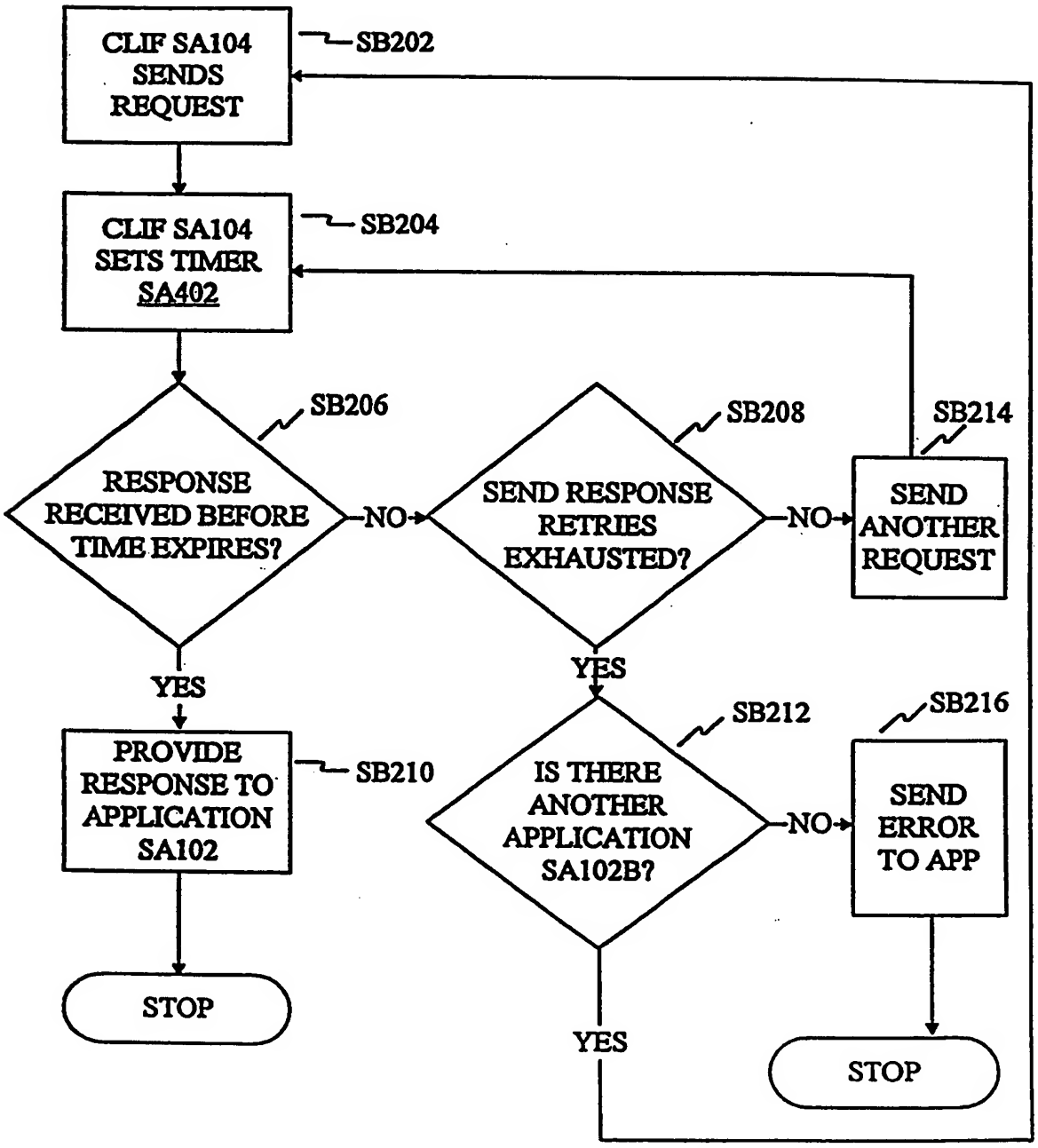

CLIF SA104 SENDS REQUEST
SB202
CLIF SA104 SETS TIMER SA402
SB204
RESPONSE RECEIVED BEFORE TIME EXPIRES?
SB206
NO
SEND RESPONSE RETRIES EXHAUSTED?
SB208
NO
SEND ANOTHER REQUEST
SB214
YES
YES
PROVIDE RESPONSE TO APPLICATION SA102
SB210
IS THERE ANOTHER APPLICATION SA102B?
SB212
NO
SEND ERROR TO APP
SB216
STOP
YES
STOP

FIG 136

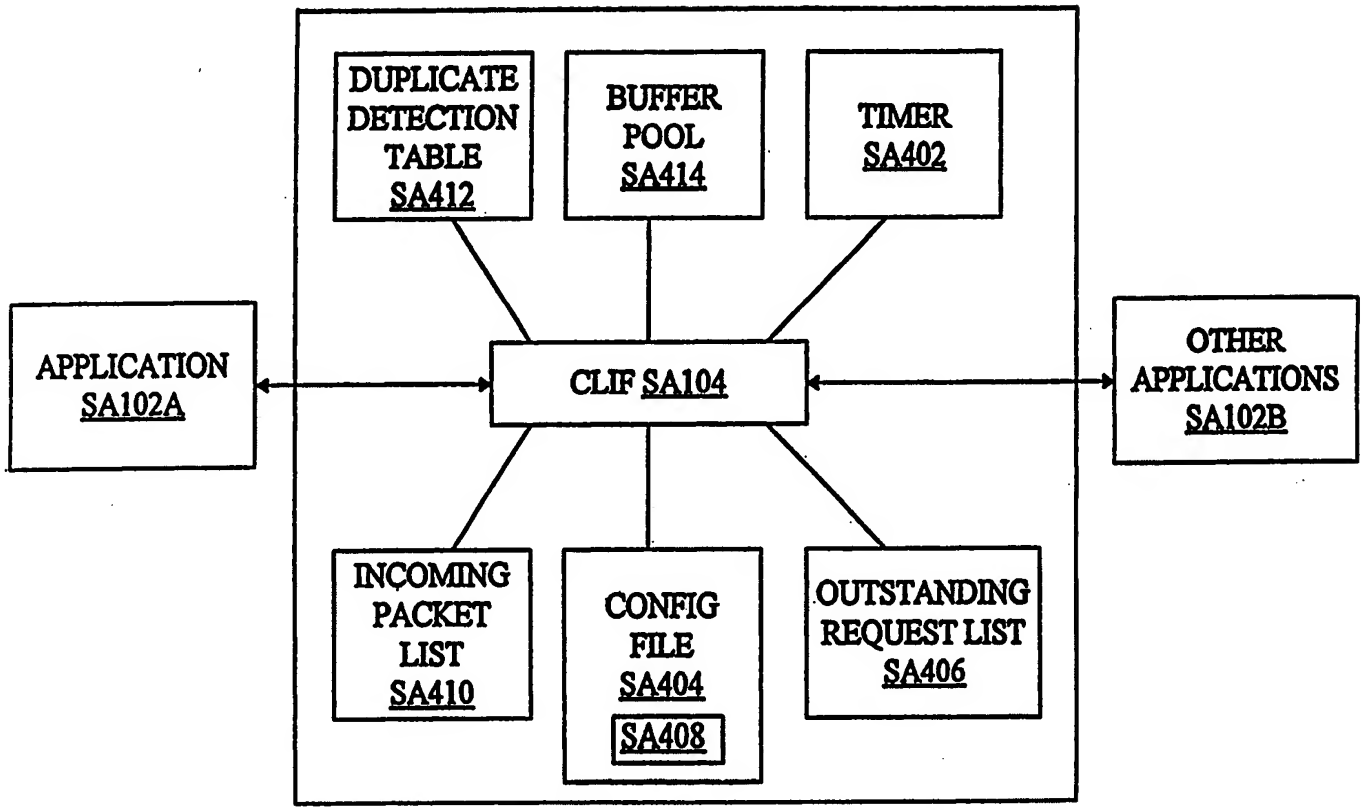

DUPLICATE DETECTION TABLE SA412
BUFFER POOL SA414
TIMER SA402
APPLICATION SA102A
CLIF SA104
OTHER APPLICATIONS SA102B
INCOMING PACKET LIST SA410
CONFIG FILE SA404
SA408
OUTSTANDING REQUEST LIST SA406

FIG 137

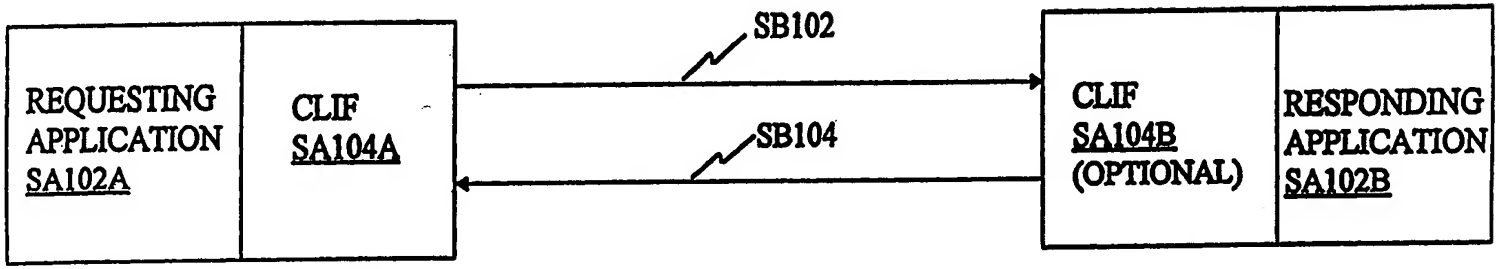

REQUESTING APPLICATION SA102A
CLIF SA104A
SB102
SB104
CLIF SA104B (OPTIONAL)
RESPONDING APPLICATION SA102B

FIG 138

FIG 140	FIG 141

FIG 139

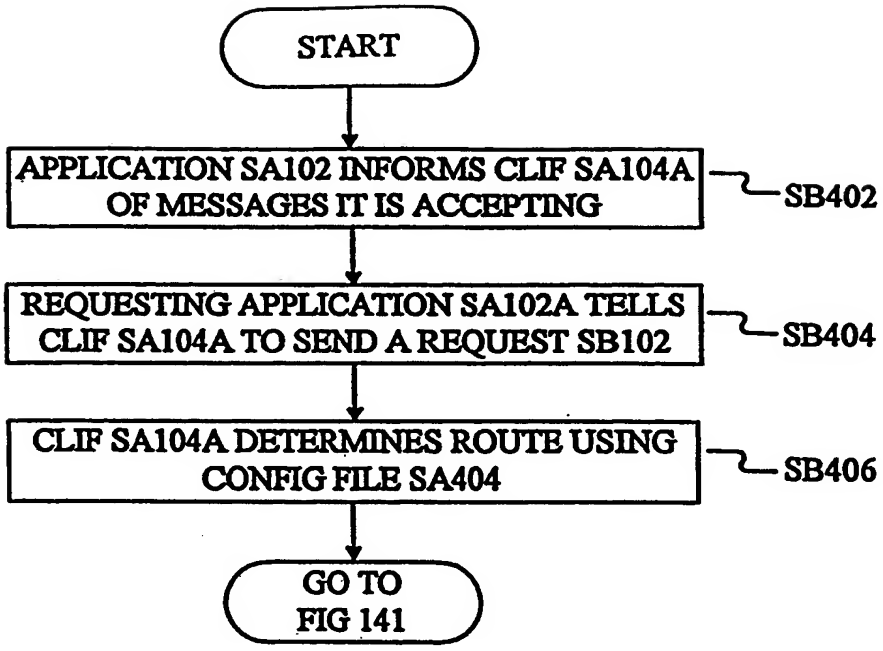

START
APPLICATION SA102 INFORMS CLIF SA104A OF MESSAGES IT IS ACCEPTING
SB402
REQUESTING APPLICATION SA102A TELLS CLIF SA104A TO SEND A REQUEST SB102
SB404
CLIF SA104A DETERMINES ROUTE USING CONFIG FILE SA404
SB406
GO TO FIG 141

FIG 140

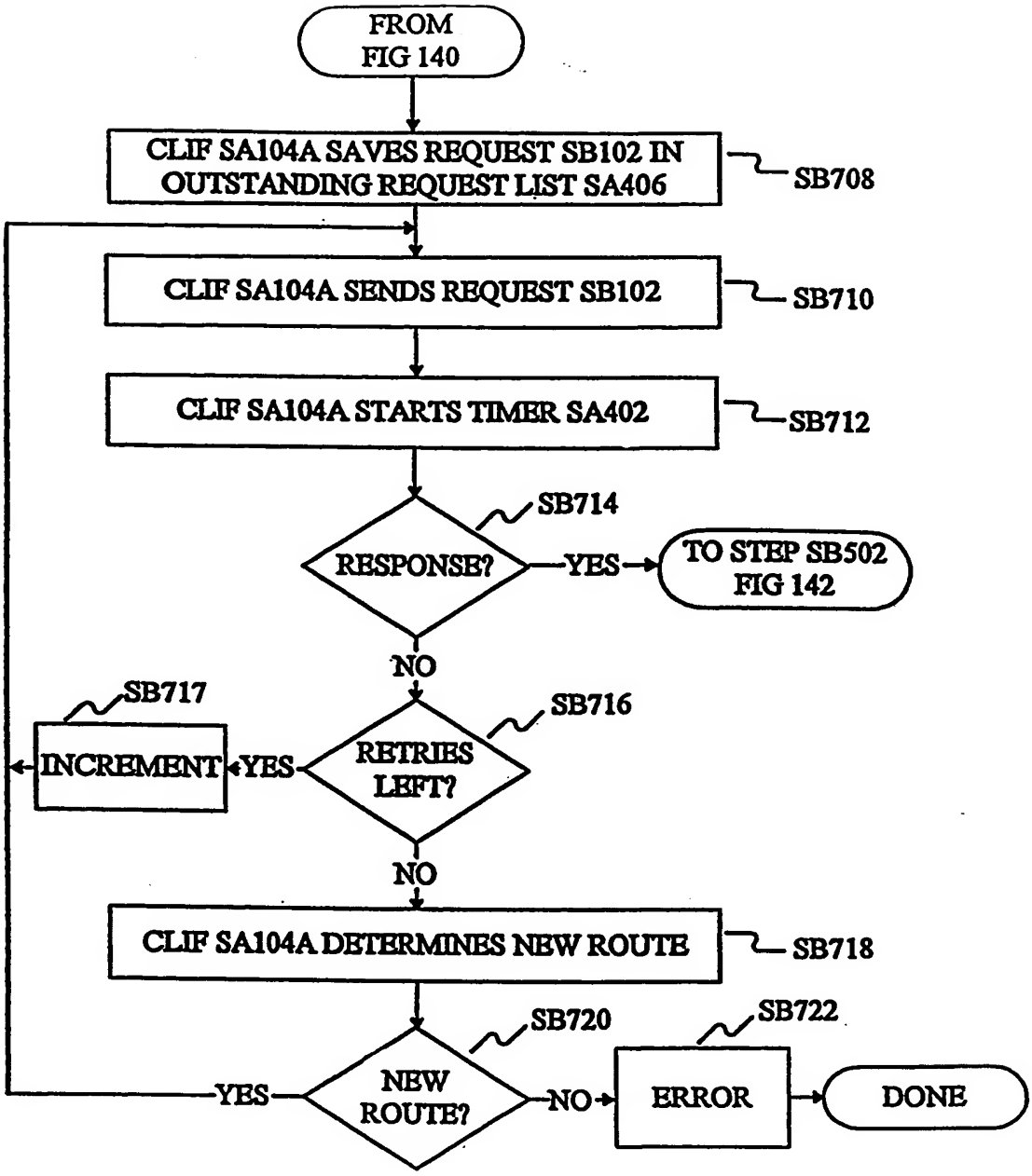

FROM FIG 140
CLIF SA104A SAVES REQUEST SB102 IN OUTSTANDING REQUEST LIST SA406
SB708
CLIF SA104A SENDS REQUEST SB102
SB710
CLIF SA104A STARTS TIMER SA402
SB712
SB714
RESPONSE?
YES
TO STEP SB502 FIG 142
NO
SB717
SB716
INCREMENT
YES
RETRIES LEFT?
NO
CLIF SA104A DETERMINES NEW ROUTE
SB718
SB720
SB722
YES
NEW ROUTE?
NO
ERROR
DONE

FIG 141

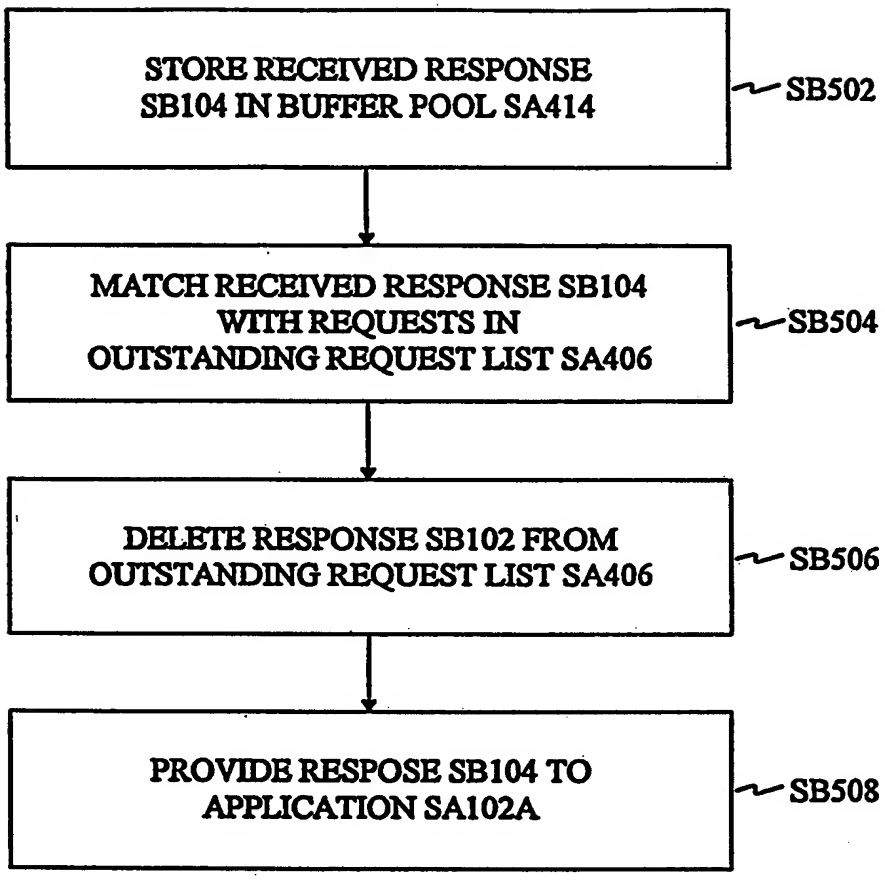

STORE RECEIVED RESPONSE SB104 IN BUFFER POOL SA414
SB502
MATCH RECEIVED RESPONSE SB104 WITH REQUESTS IN OUTSTANDING REQUEST LIST SA406
SB504
DELETE RESPONSE SB102 FROM OUTSTANDING REQUEST LIST SA406
SB506
PROVIDE RESPOSE SB104 TO APPLICATION SA102A
SB508

FIG 142

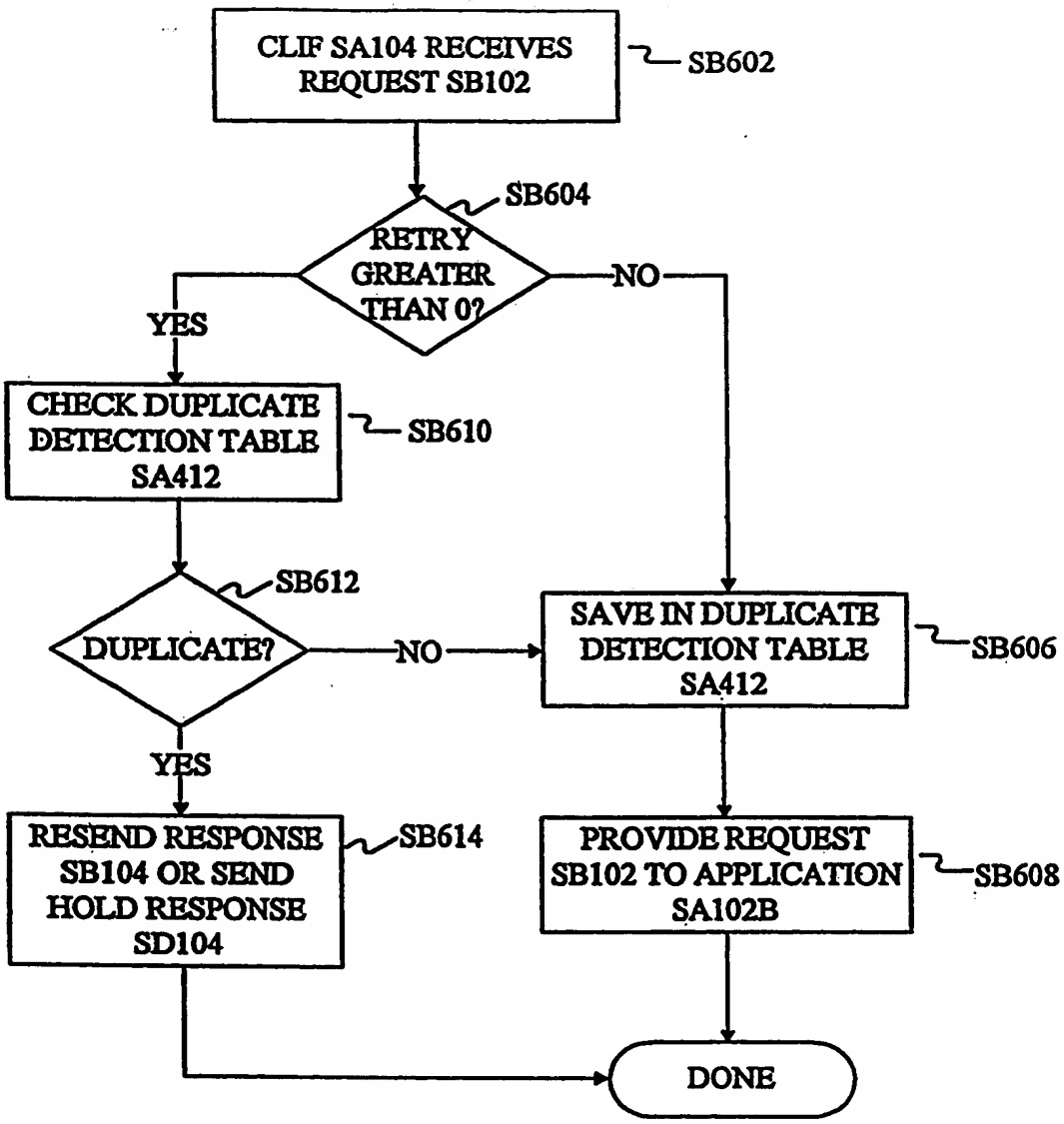

CLIF SA104 RECEIVES REQUEST SB102
SB602
SB604
RETRY GREATER THAN 0?
NO
YES
CHECK DUPLICATE DETECTION TABLE SA412
SB610
SB612
DUPLICATE?
NO
SAVE IN DUPLICATE DETECTION TABLE SA412
SB606
YES
RESEND RESPONSE SB104 OR SEND HOLD RESPONSE SD104
SB614
PROVIDE REQUEST SB102 TO APPLICATION SA102B
SB608
DONE

FIG 143

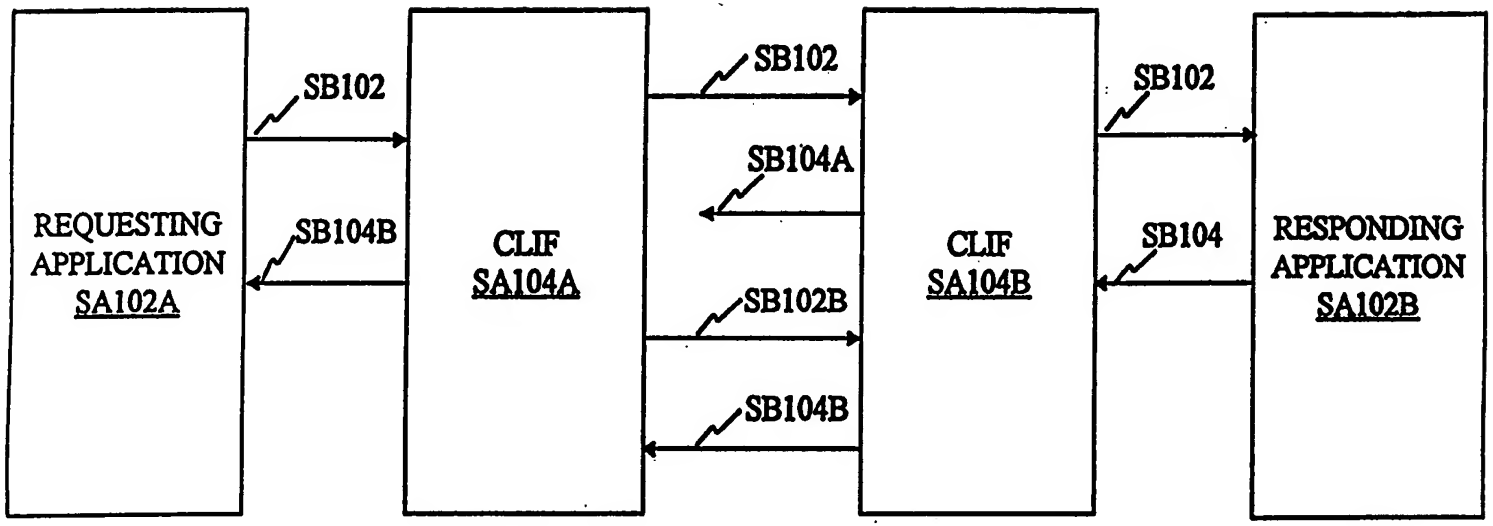

REQUESTING APPLICATION SA102A
SB102
SB104B
CLIF SA104A
SB102
SB104A
SB102B
SB104B
CLIF SA104B
SB102
SB104
RESPONDING APPLICATION SA102B

FIG 144

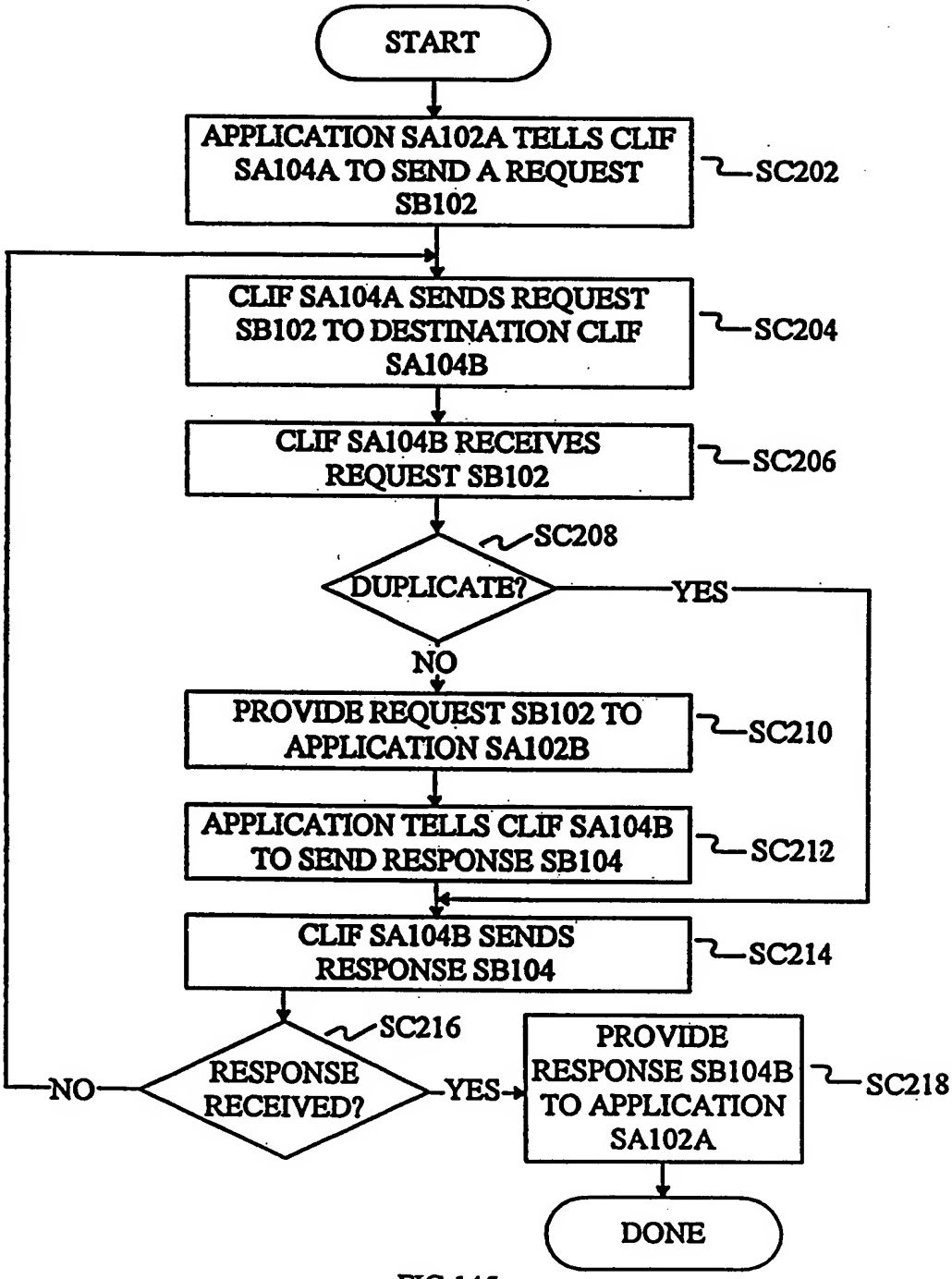

START
APPLICATION SA102A TELLS CLIF SA104A TO SEND A REQUEST SB102
SC202
CLIF SA104A SENDS REQUEST SB102 TO DESTINATION CLIF SA104B
SC204
CLIF SA104B RECEIVES REQUEST SB102
SC206
SC208
DUPLICATE?
YES
NO
PROVIDE REQUEST SB102 TO APPLICATION SA102B
SC210
APPLICATION TELLS CLIF SA104B TO SEND RESPONSE SB104
SC212
CLIF SA104B SENDS RESPONSE SB104
SC214
SC216
RESPONSE RECEIVED?
NO
YES
PROVIDE RESPONSE SB104B TO APPLICATION SA102A
SC218
DONE

FIG 145

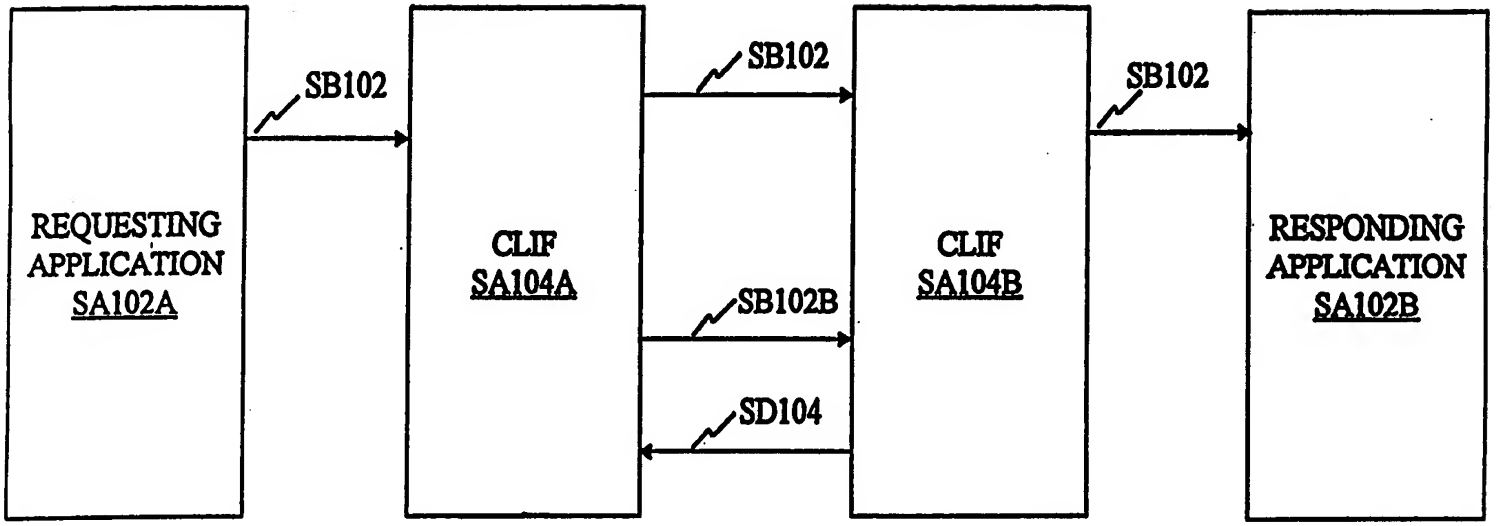

REQUESTING APPLICATION SA102A
SB102
CLIF SA104A
SB102
SB102B
SD104
CLIF SA104B
SB102
RESPONDING APPLICATION SA102B

FIG 146

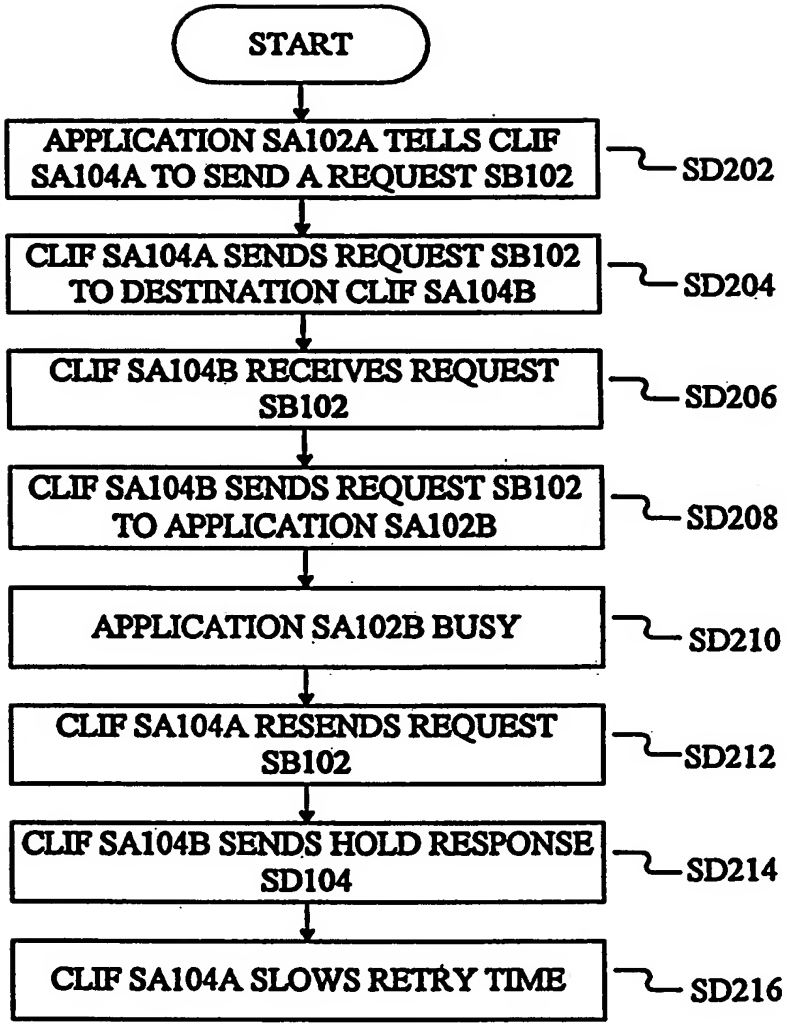

START
APPLICATION SA102A TELLS CLIF SA104A TO SEND A REQUEST SB102
SD202
CLIF SA104A SENDS REQUEST SB102 TO DESTINATION CLIF SA104B
SD204
CLIF SA104B RECEIVES REQUEST SB102
SD206
CLIF SA104B SENDS REQUEST SB102 TO APPLICATION SA102B
SD208
APPLICATION SA102B BUSY
SD210
CLIF SA104A RESENDS REQUEST SB102
SD212
CLIF SA104B SENDS HOLD RESPONSE SD104
SD214
CLIF SA104A SLOWS RETRY TIME
SD216

FIG 147

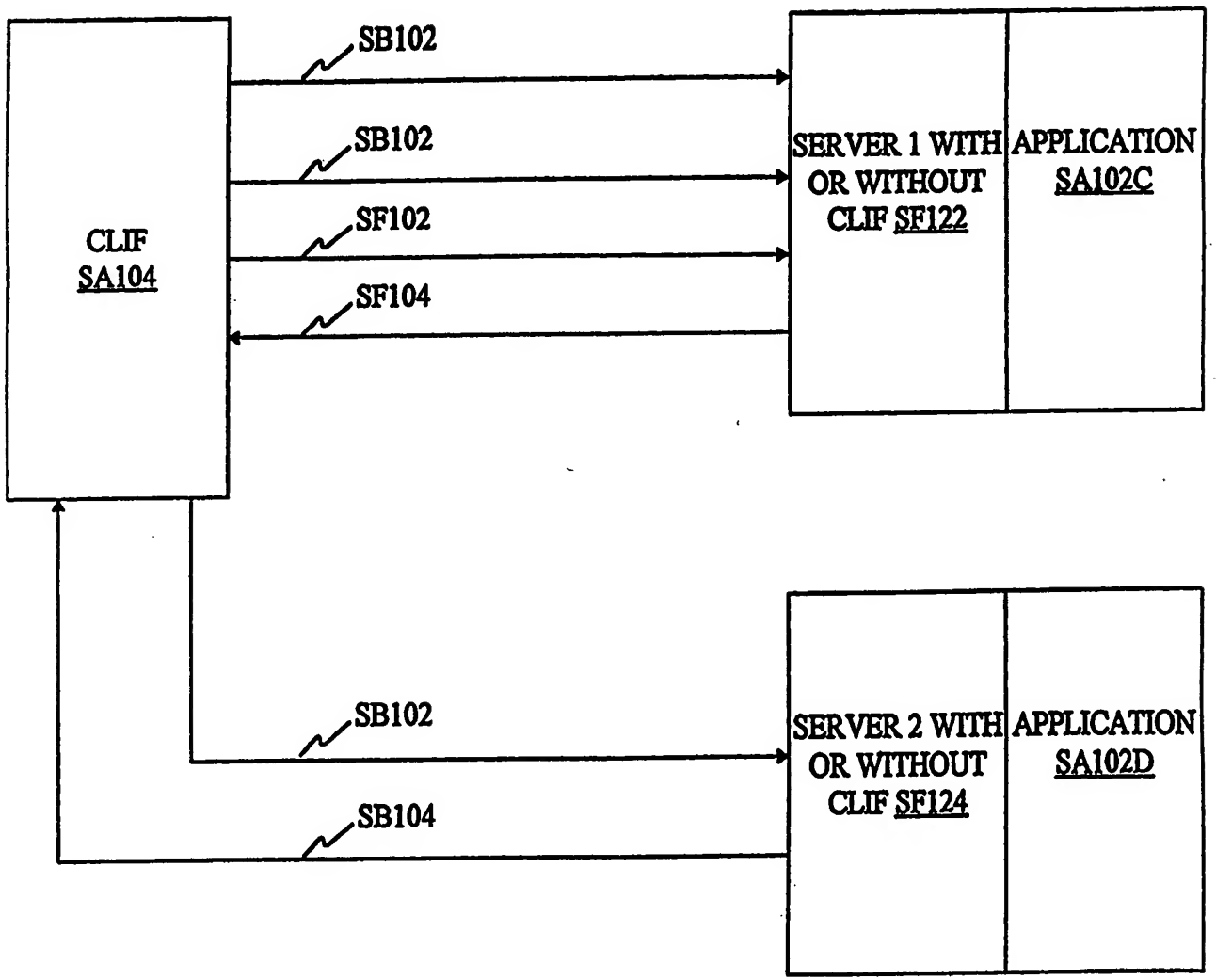

CLIF
SA104
SB102
SB102
SF102
SF104
SERVER 1 WITH OR WITHOUT CLIF SF122
APPLICATION SA102C
SB102
SB104
SERVER 2 WITH OR WITHOUT CLIF SF124
APPLICATION SA102D

FIG 148

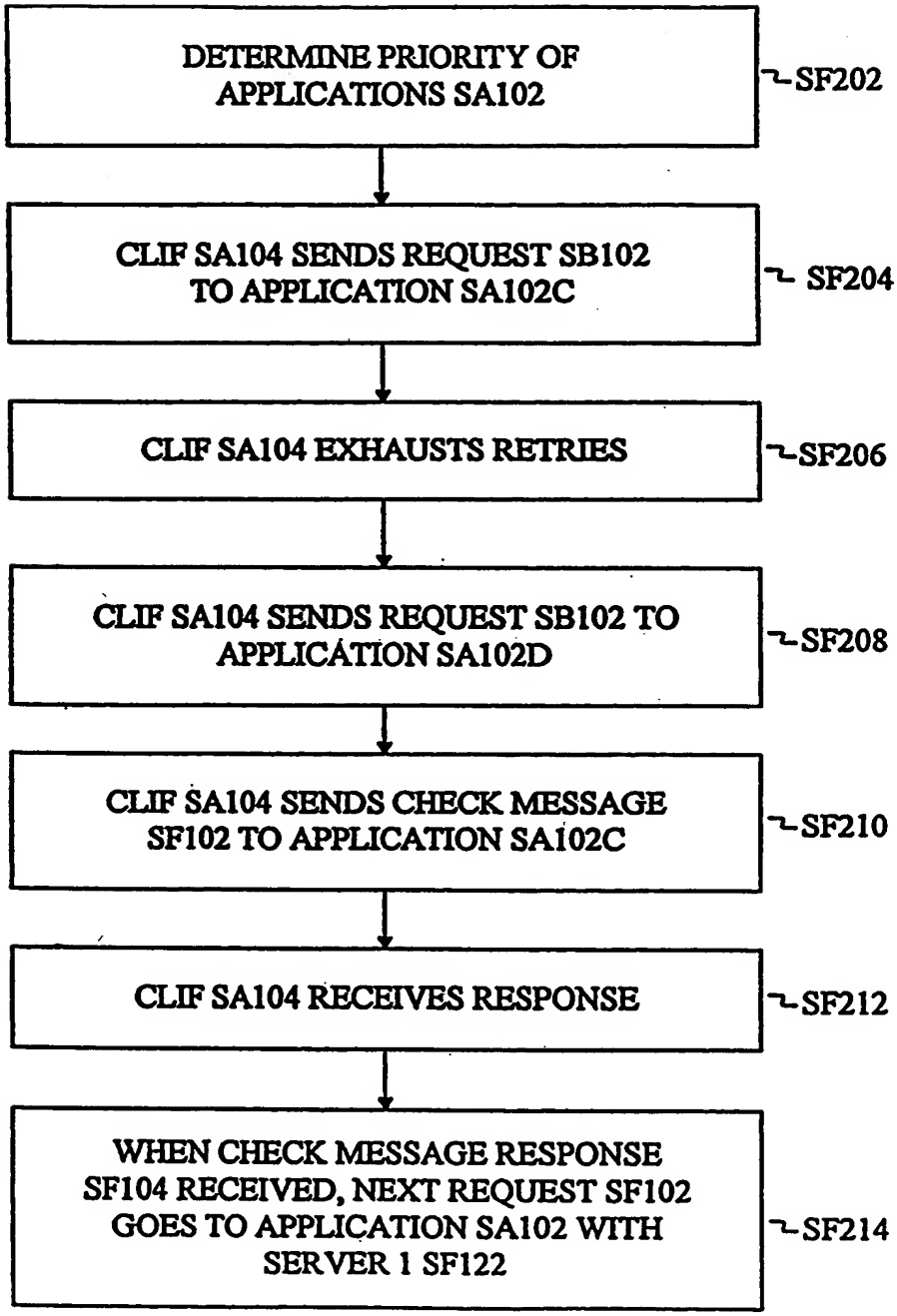

DETERMINE PRIORITY OF APPLICATIONS SA102
SF202
CLIF SA104 SENDS REQUEST SB102 TO APPLICATION SA102C
SF204
CLIF SA104 EXHAUSTS RETRIES
SF206
CLIF SA104 SENDS REQUEST SB102 TO APPLICATION SA102D
SF208
CLIF SA104 SENDS CHECK MESSAGE SF102 TO APPLICATION SA102C
SF210
CLIF SA104 RECEIVES RESPONSE
SF212
WHEN CHECK MESSAGE RESPONSE SF104 RECEIVED, NEXT REQUEST SF102 GOES TO APPLICATION SA102 WITH SERVER 1 SF122
SF214

FIG 149

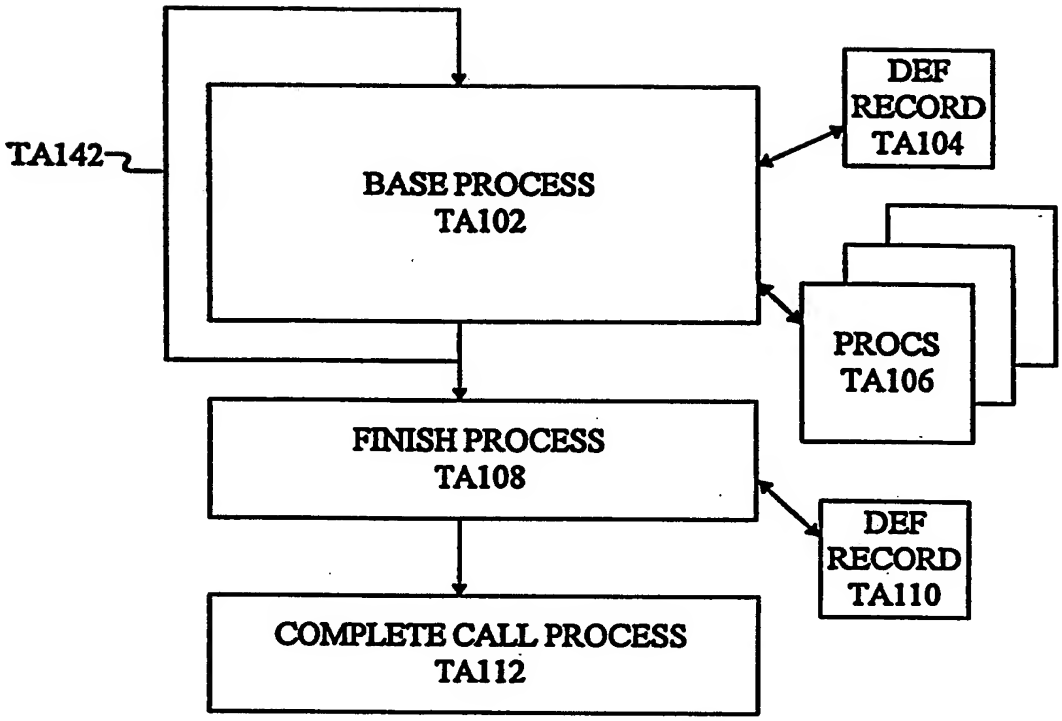

TA142
BASE PROCESS
TA102
DEF
RECORD
TA104
PROCS
TA106
FINISH PROCESS
TA108
DEF
RECORD
TA110
COMPLETE CALL PROCESS
TA112

FIG 150

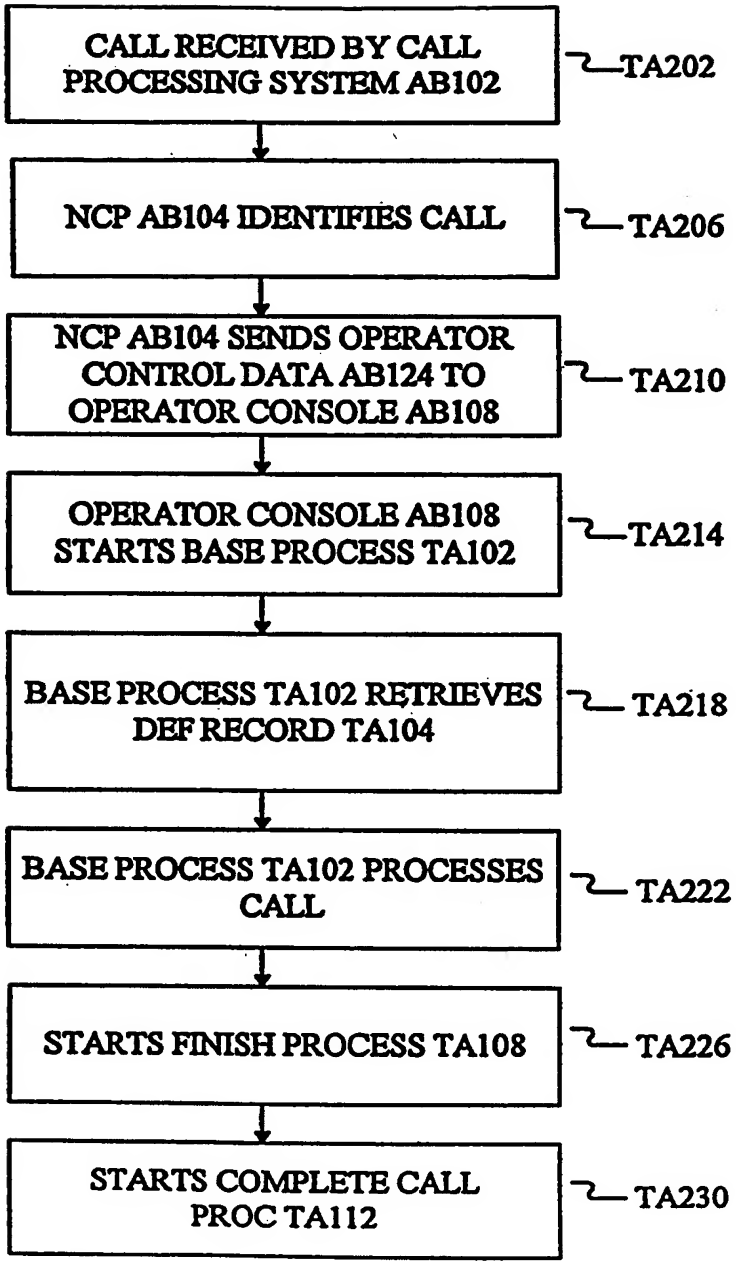

CALL RECEIVED BY CALL PROCESSING SYSTEM AB102
TA202
NCP AB104 IDENTIFIES CALL
TA206
NCP AB104 SENDS OPERATOR CONTROL DATA AB124 TO OPERATOR CONSOLE AB108
TA210
OPERATOR CONSOLE AB108 STARTS BASE PROCESS TA102
TA214
BASE PROCESS TA102 RETRIEVES DEF RECORD TA104
TA218
BASE PROCESS TA102 PROCESSES CALL
TA222
STARTS FINISH PROCESS TA108
TA226
STARTS COMPLETE CALL PROC TA112
TA230

FIG 151

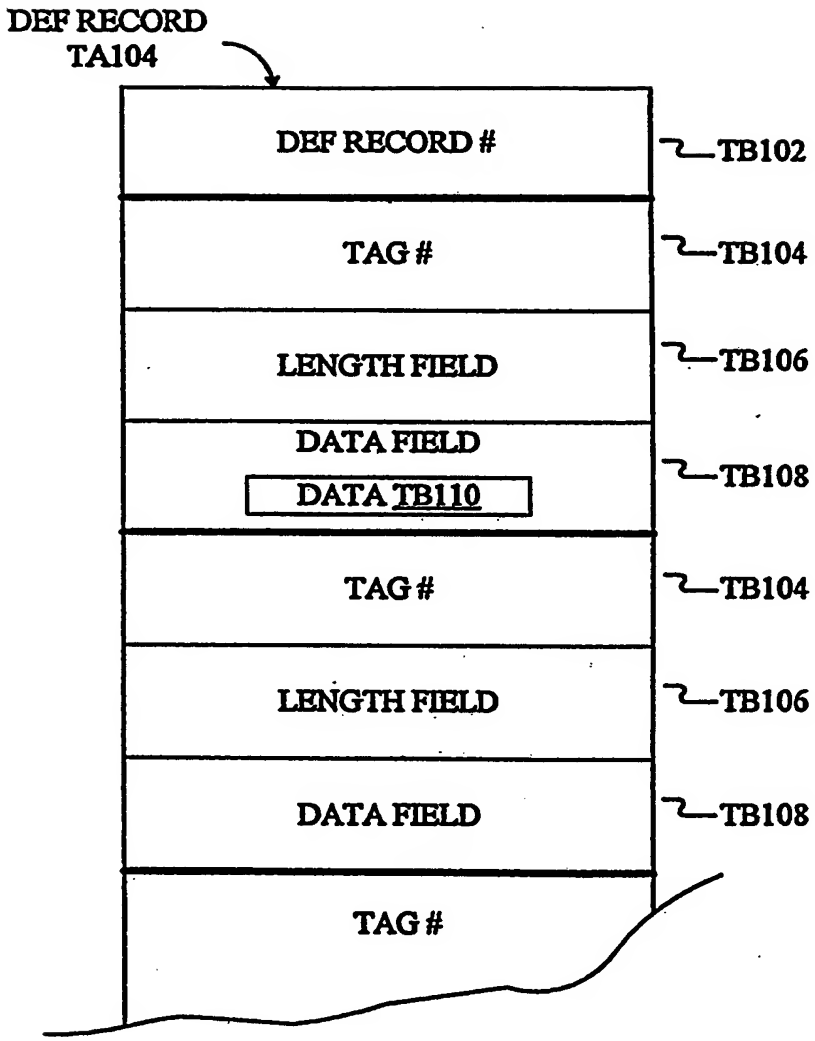

DEF RECORD
TA104
DEF RECORD #
TB102
TAG #
TB104
LENGTH FIELD
TB106
DATA FIELD
DATA TB110
TB108
TAG #
TB104
LENGTH FIELD
TB106
DATA FIELD
TB108
TAG #

FIG 152

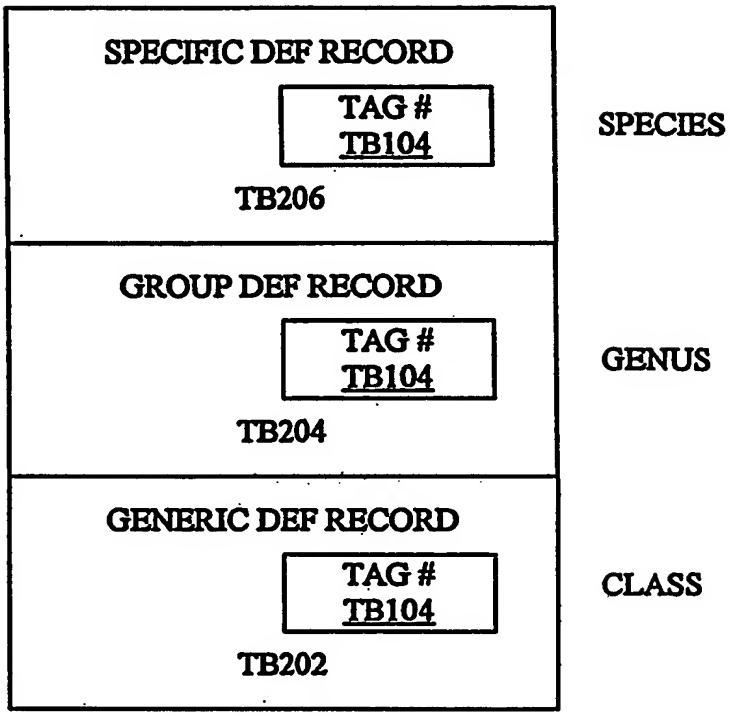

SPECIFIC DEF RECORD
TAG #
TB104
TB206
SPECIES
GROUP DEF RECORD
TAG #
TB104
TB204
GENUS
GENERIC DEF RECORD
TAG #
TB104
TB202
CLASS

FIG 153

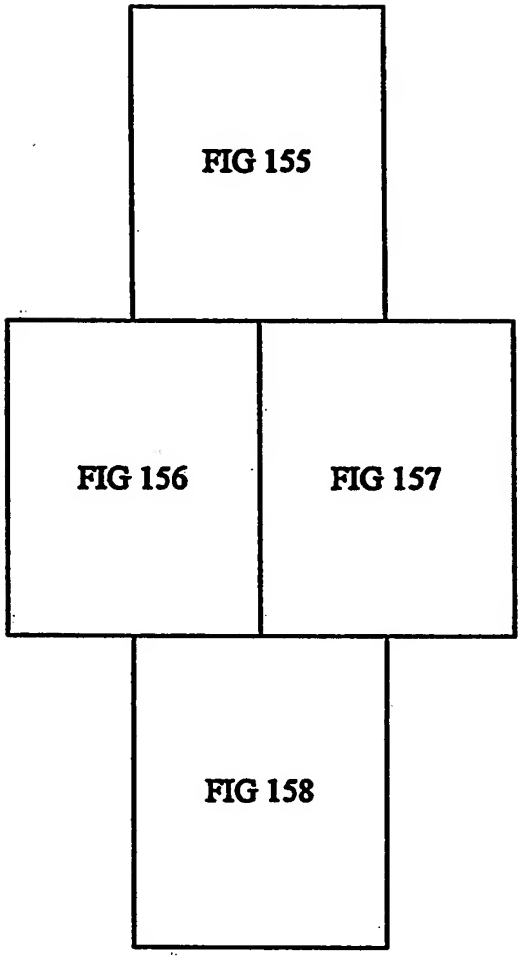


FIG 154

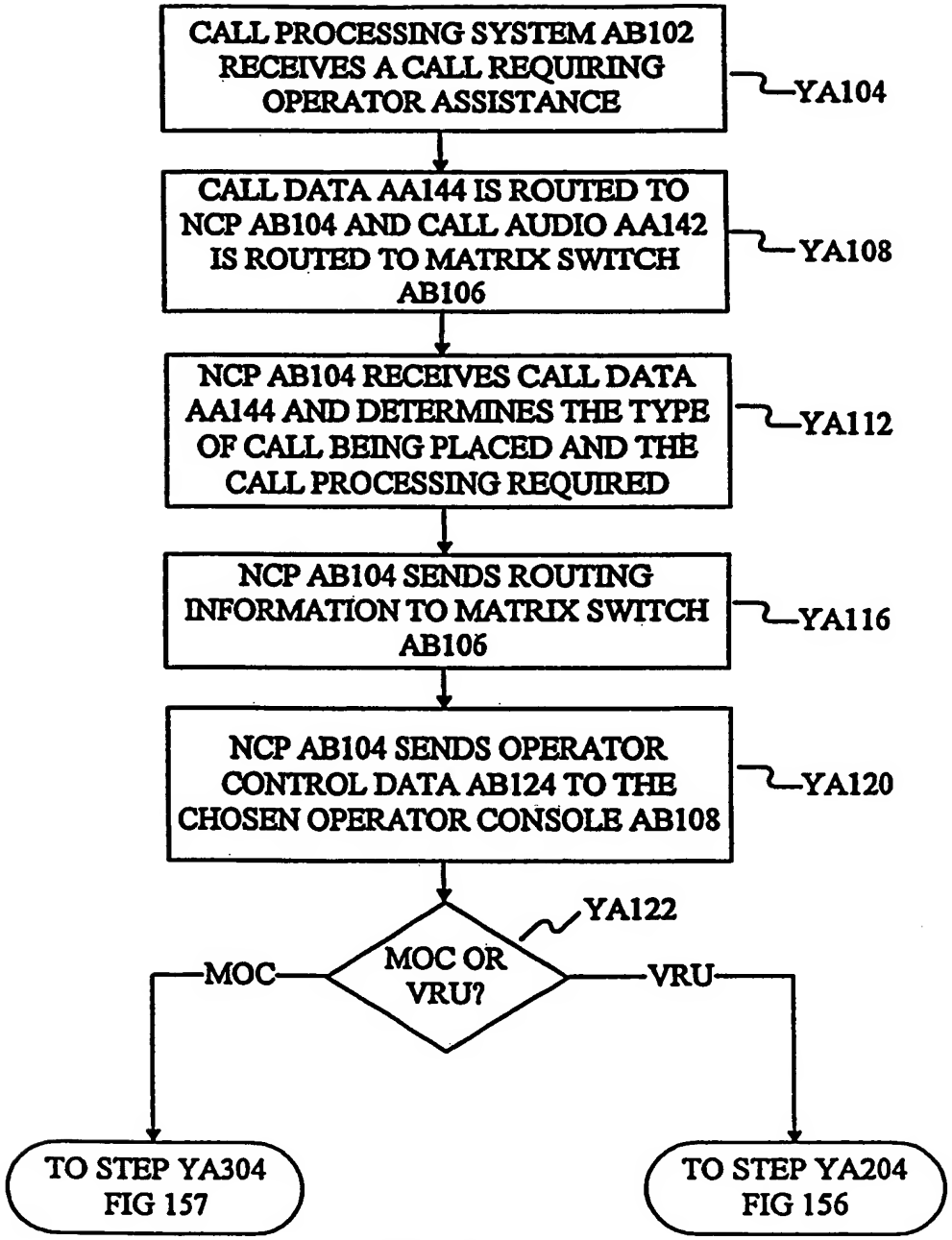

CALL PROCESSING SYSTEM AB102 RECEIVES A CALL REQUIRING OPERATOR ASSISTANCE
YA104
CALL DATA AA144 IS ROUTED TO NCP AB104 AND CALL AUDIO AA142 IS ROUTED TO MATRIX SWITCH AB106
YA108
NCP AB104 RECEIVES CALL DATA AA144 AND DETERMINES THE TYPE OF CALL BEING PLACED AND THE CALL PROCESSING REQUIRED
YA112
NCP AB104 SENDS ROUTING INFORMATION TO MATRIX SWITCH AB106
YA116
NCP AB104 SENDS OPERATOR CONTROL DATA AB124 TO THE CHOSEN OPERATOR CONSOLE AB108
YA120
YA122
MOC OR VRU?
MOC
VRU
TO STEP YA304 FIG 157
TO STEP YA204 FIG 156

FIG 155

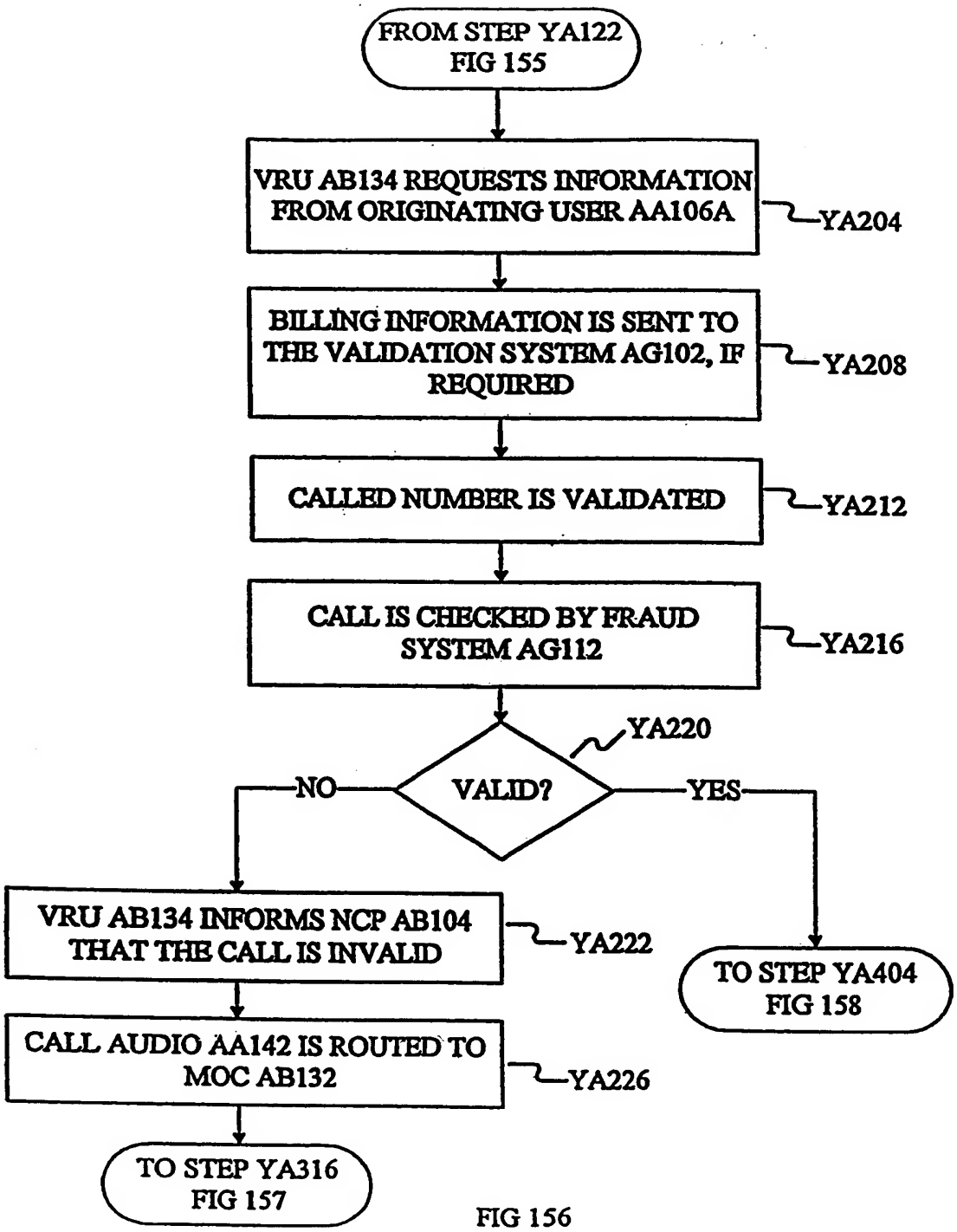

FROM STEP YA122
FIG 155
VRU AB134 REQUESTS INFORMATION FROM ORIGINATING USER AA106A
YA204
BILLING INFORMATION IS SENT TO THE VALIDATION SYSTEM AG102, IF REQUIRED
YA208
CALLED NUMBER IS VALIDATED
YA212
CALL IS CHECKED BY FRAUD SYSTEM AG112
YA216
YA220
VALID?
NO
YES
VRU AB134 INFORMS NCP AB104 THAT THE CALL IS INVALID
YA222
TO STEP YA404
FIG 158
CALL AUDIO AA142 IS ROUTED TO MOC AB132
YA226
TO STEP YA316
FIG 157

FIG 156

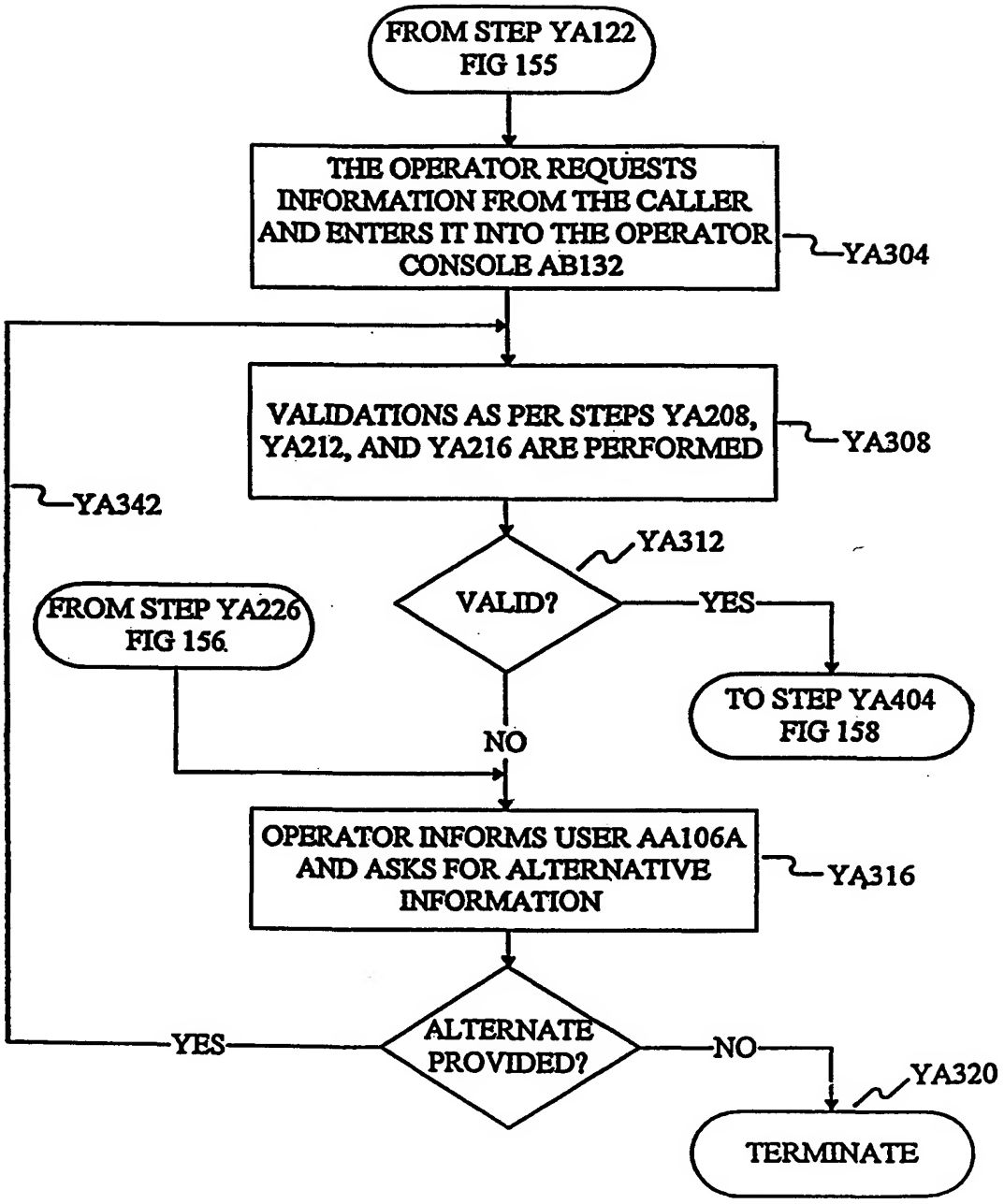

FROM STEP YA122
FIG 155
THE OPERATOR REQUESTS INFORMATION FROM THE CALLER AND ENTERS IT INTO THE OPERATOR CONSOLE AB132
YA304
VALIDATIONS AS PER STEPS YA208, YA212, AND YA216 ARE PERFORMED
YA308
YA342
YA312
VALID?
YES
FROM STEP YA226
FIG 156
TO STEP YA404
FIG 158
NO
OPERATOR INFORMS USER AA106A AND ASKS FOR ALTERNATIVE INFORMATION
YA316
ALTERNATE PROVIDED?
YES
NO
YA320
TERMINATE

FIG 157

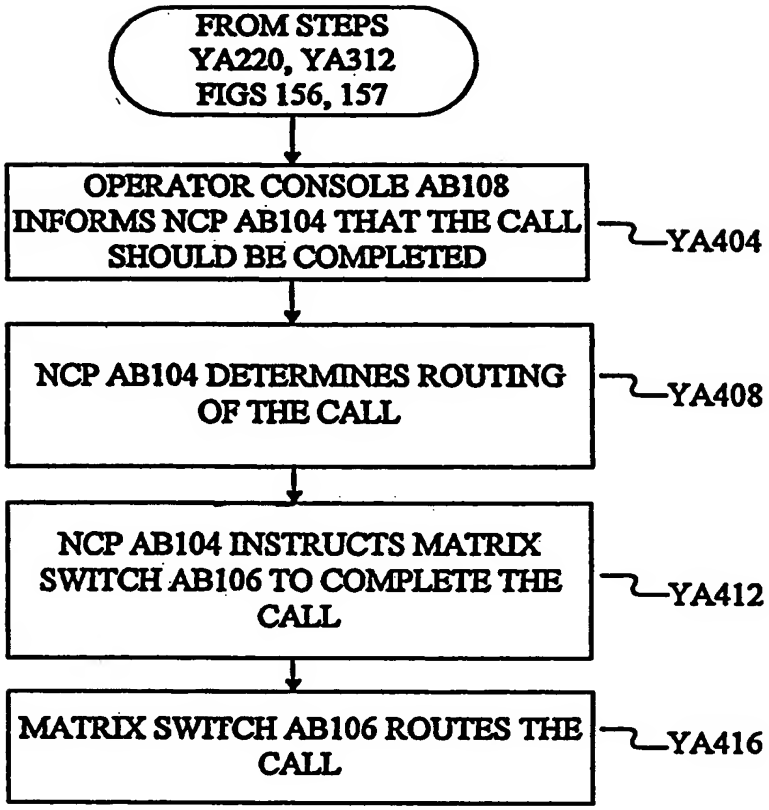

FROM STEPS
YA220, YA312
FIGS 156, 157
OPERATOR CONSOLE AB108 INFORMS NCP AB104 THAT THE CALL SHOULD BE COMPLETED
YA404
NCP AB104 DETERMINES ROUTING OF THE CALL
YA408
NCP AB104 INSTRUCTS MATRIX SWITCH AB106 TO COMPLETE THE CALL
YA412
MATRIX SWITCH AB106 ROUTES THE CALL
YA416

FIG 158

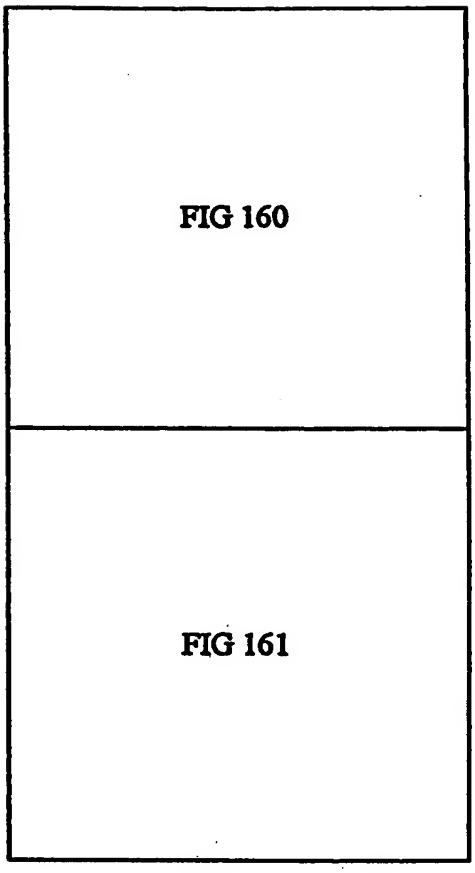


FIG 159

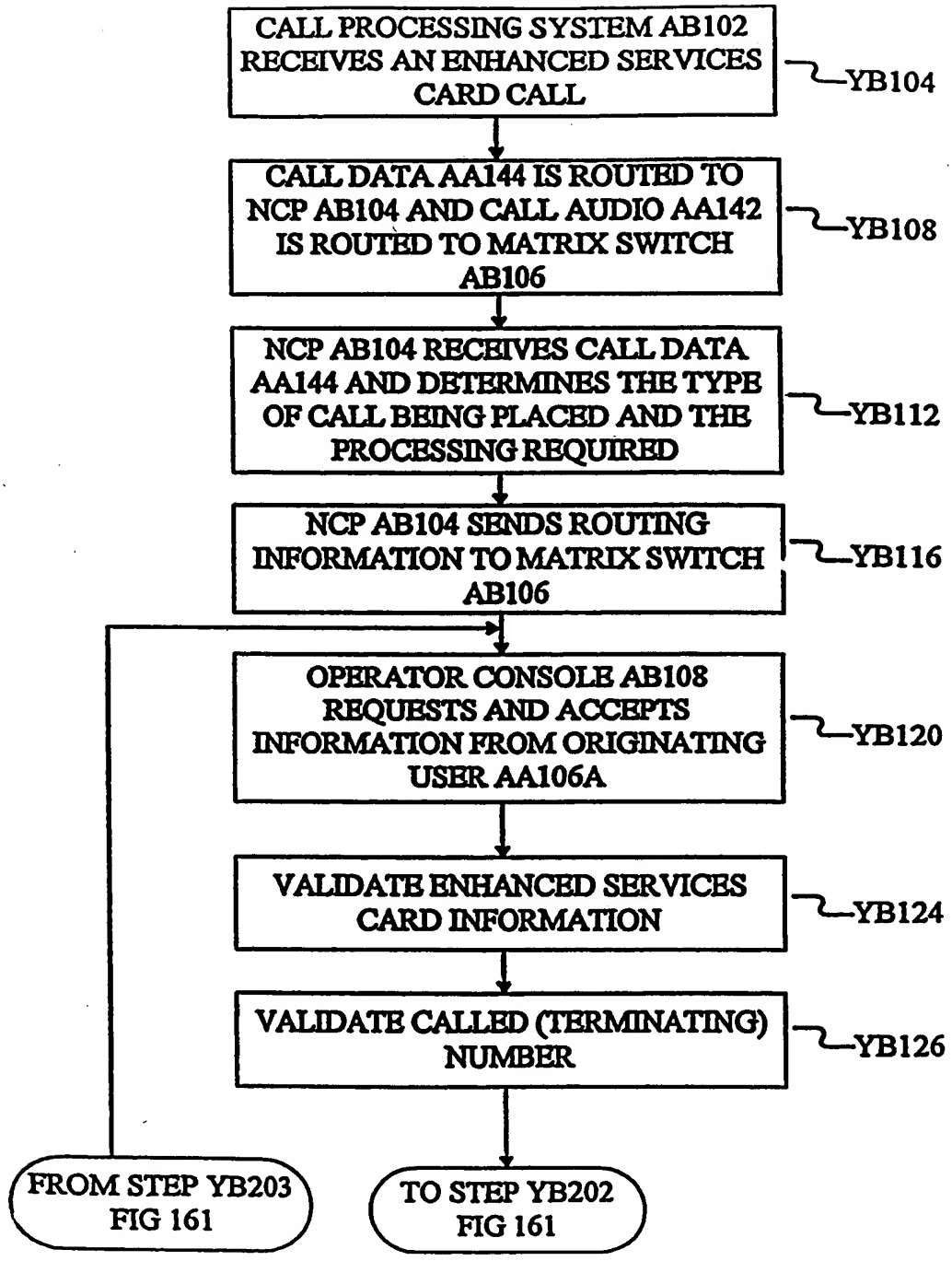

CALL PROCESSING SYSTEM AB102 RECEIVES AN ENHANCED SERVICES CARD CALL
YB104
CALL DATA AA144 IS ROUTED TO NCP AB104 AND CALL AUDIO AA142 IS ROUTED TO MATRIX SWITCH AB106
YB108
NCP AB104 RECEIVES CALL DATA AA144 AND DETERMINES THE TYPE OF CALL BEING PLACED AND THE PROCESSING REQUIRED
YB112
NCP AB104 SENDS ROUTING INFORMATION TO MATRIX SWITCH AB106
YB116
OPERATOR CONSOLE AB108 REQUESTS AND ACCEPTS INFORMATION FROM ORIGINATING USER AA106A
YB120
VALIDATE ENHANCED SERVICES CARD INFORMATION
YB124
VALIDATE CALLED (TERMINATING) NUMBER
YB126
FROM STEP YB203 FIG 161
TO STEP YB202 FIG 161

FIG 160

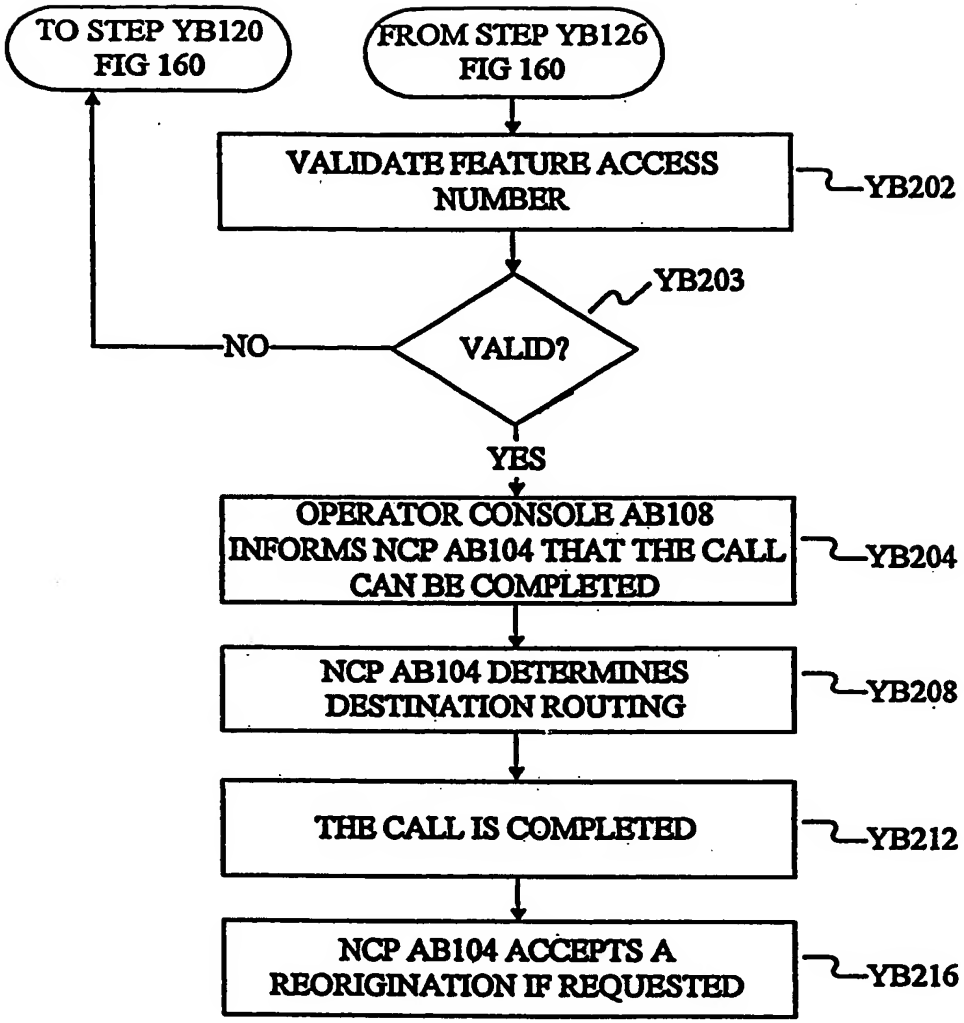

TO STEP YB120
FIG 160
FROM STEP YB126
FIG 160
VALIDATE FEATURE ACCESS NUMBER
YB202
YB203
VALID?
NO
YES
OPERATOR CONSOLE AB108 INFORMS NCP AB104 THAT THE CALL CAN BE COMPLETED
YB204
NCP AB104 DETERMINES DESTINATION ROUTING
YB208
THE CALL IS COMPLETED
YB212
NCP AB104 ACCEPTS A REORIGINATION IF REQUESTED
YB216

FIG 161

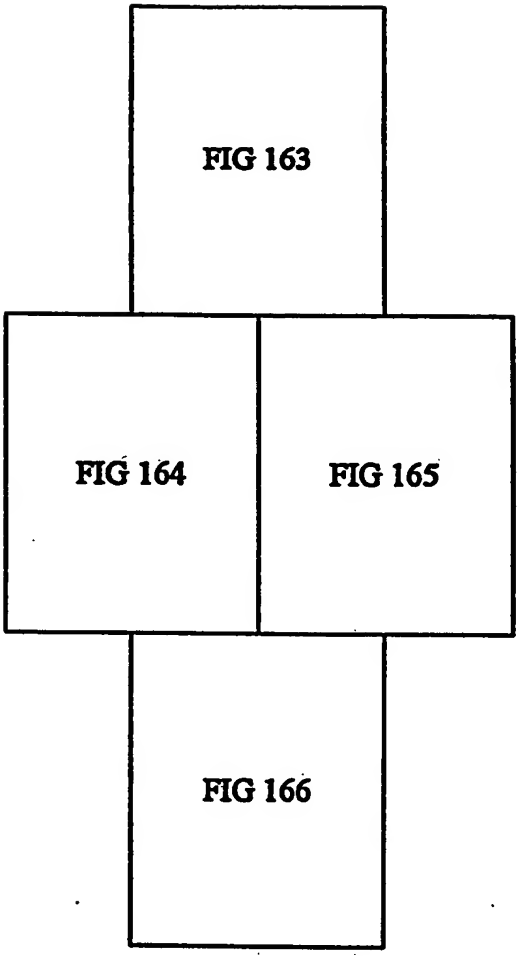


FIG 162

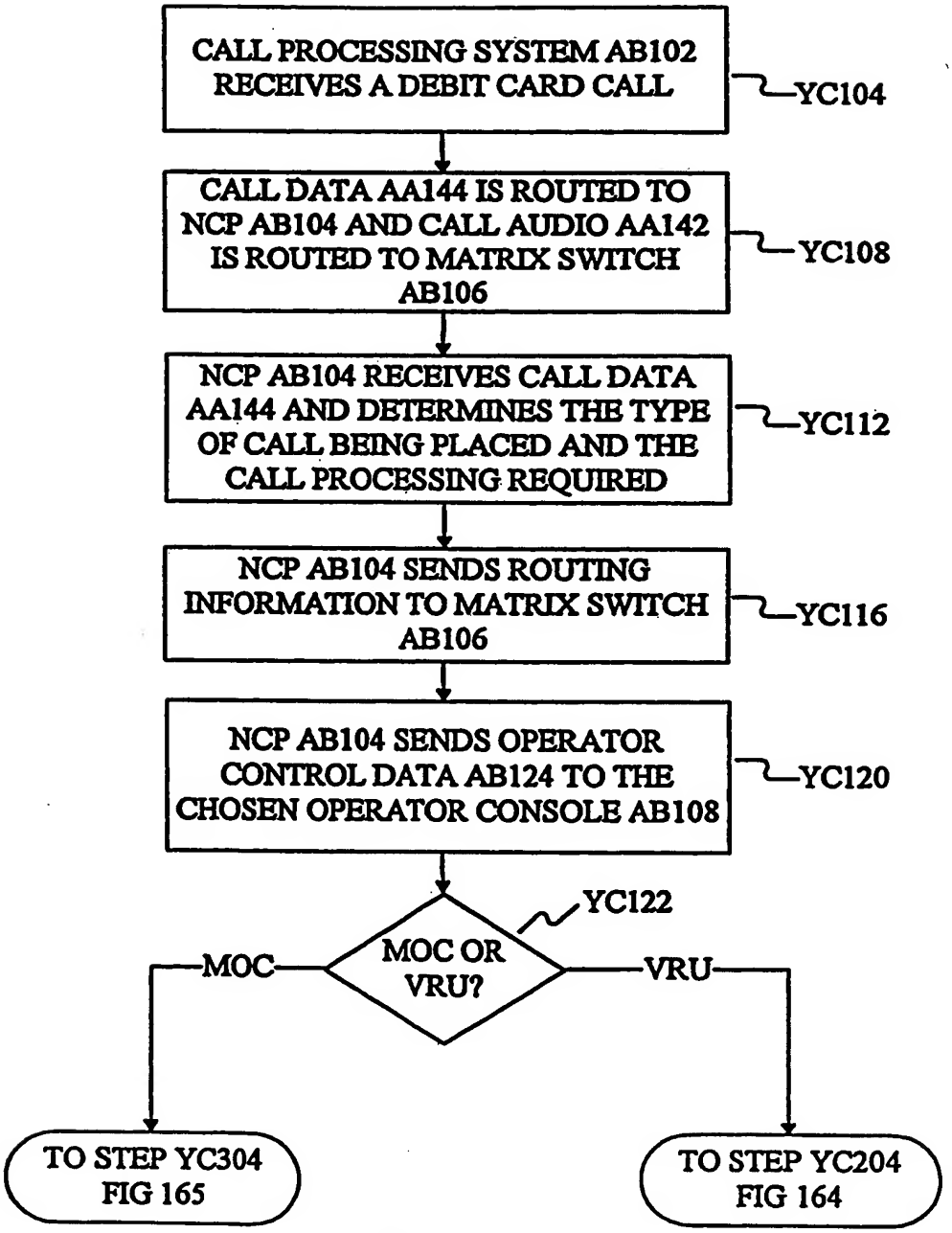

CALL PROCESSING SYSTEM AB102 RECEIVES A DEBIT CARD CALL
YC104
CALL DATA AA144 IS ROUTED TO NCP AB104 AND CALL AUDIO AA142 IS ROUTED TO MATRIX SWITCH AB106
YC108
NCP AB104 RECEIVES CALL DATA AA144 AND DETERMINES THE TYPE OF CALL BEING PLACED AND THE CALL PROCESSING REQUIRED
YC112
NCP AB104 SENDS ROUTING INFORMATION TO MATRIX SWITCH AB106
YC116
NCP AB104 SENDS OPERATOR CONTROL DATA AB124 TO THE CHOSEN OPERATOR CONSOLE AB108
YC120
YC122
MOC OR VRU?
MOC
VRU
TO STEP YC304 FIG 165
TO STEP YC204 FIG 164

FIG 163

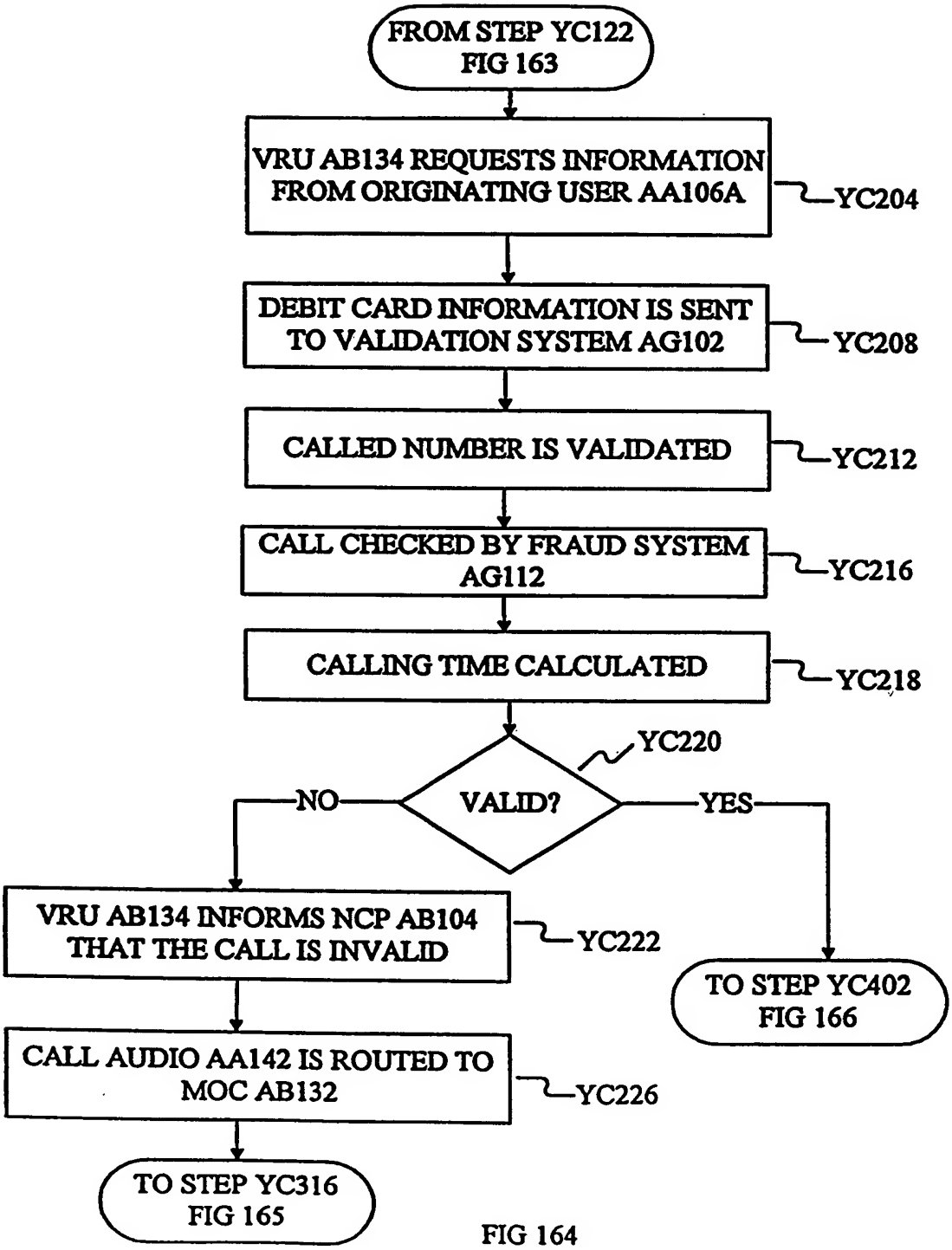

FROM STEP YC122
FIG 163
VRU AB134 REQUESTS INFORMATION FROM ORIGINATING USER AA106A
YC204
DEBIT CARD INFORMATION IS SENT TO VALIDATION SYSTEM AG102
YC208
CALLED NUMBER IS VALIDATED
YC212
CALL CHECKED BY FRAUD SYSTEM AG112
YC216
CALLING TIME CALCULATED
YC218
YC220
VALID?
NO
YES
VRU AB134 INFORMS NCP AB104 THAT THE CALL IS INVALID
YC222
TO STEP YC402
FIG 166
CALL AUDIO AA142 IS ROUTED TO MOC AB132
YC226
TO STEP YC316
FIG 165

FIG 164

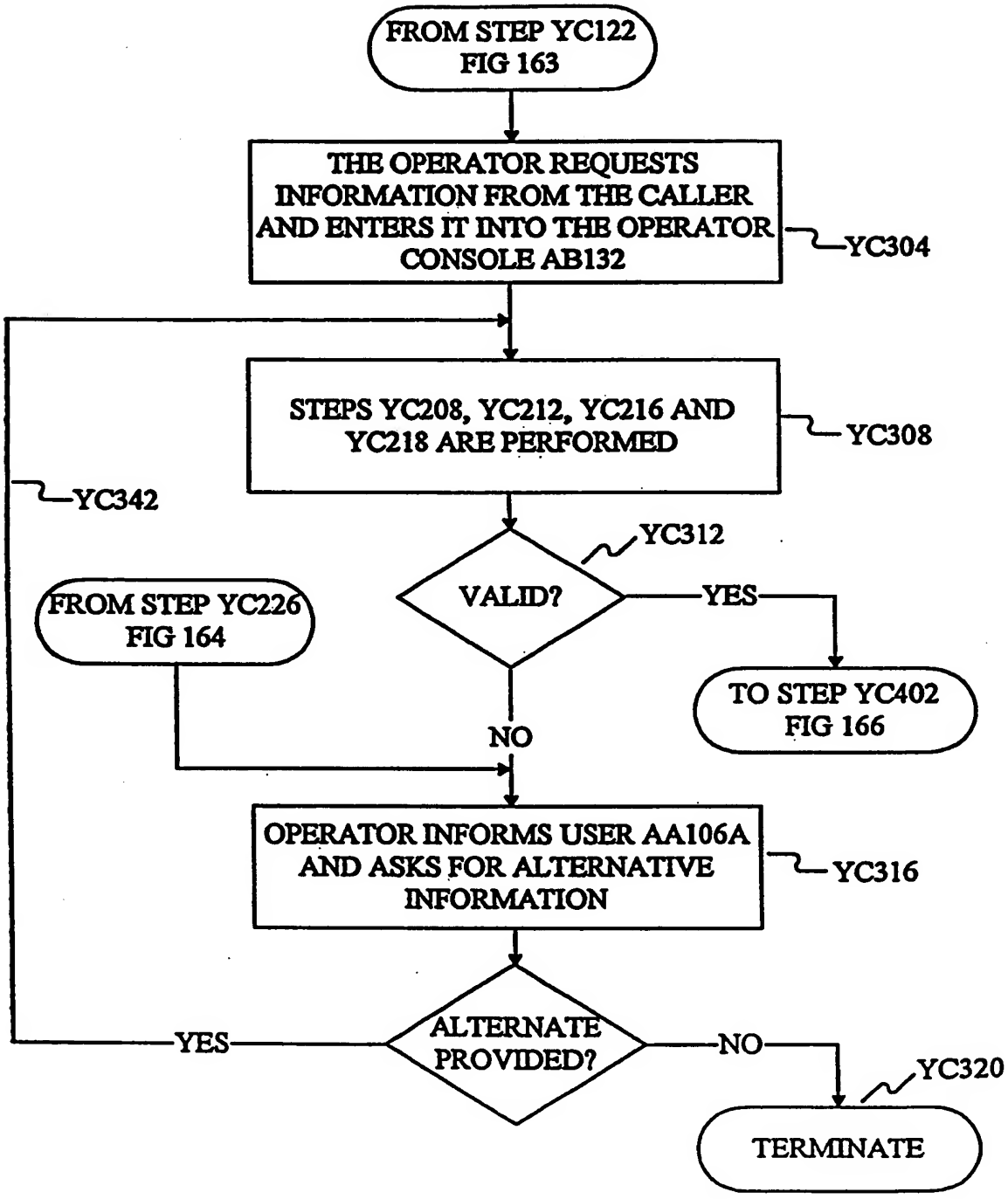

FROM STEP YC122
FIG 163
THE OPERATOR REQUESTS INFORMATION FROM THE CALLER AND ENTERS IT INTO THE OPERATOR CONSOLE AB132
YC304
STEPS YC208, YC212, YC216 AND YC218 ARE PERFORMED
YC308
YC342
YC312
VALID?
YES
FROM STEP YC226
FIG 164
TO STEP YC402
FIG 166
NO
OPERATOR INFORMS USER AA106A AND ASKS FOR ALTERNATIVE INFORMATION
YC316
ALTERNATE PROVIDED?
YES
NO
YC320
TERMINATE

FIG 165

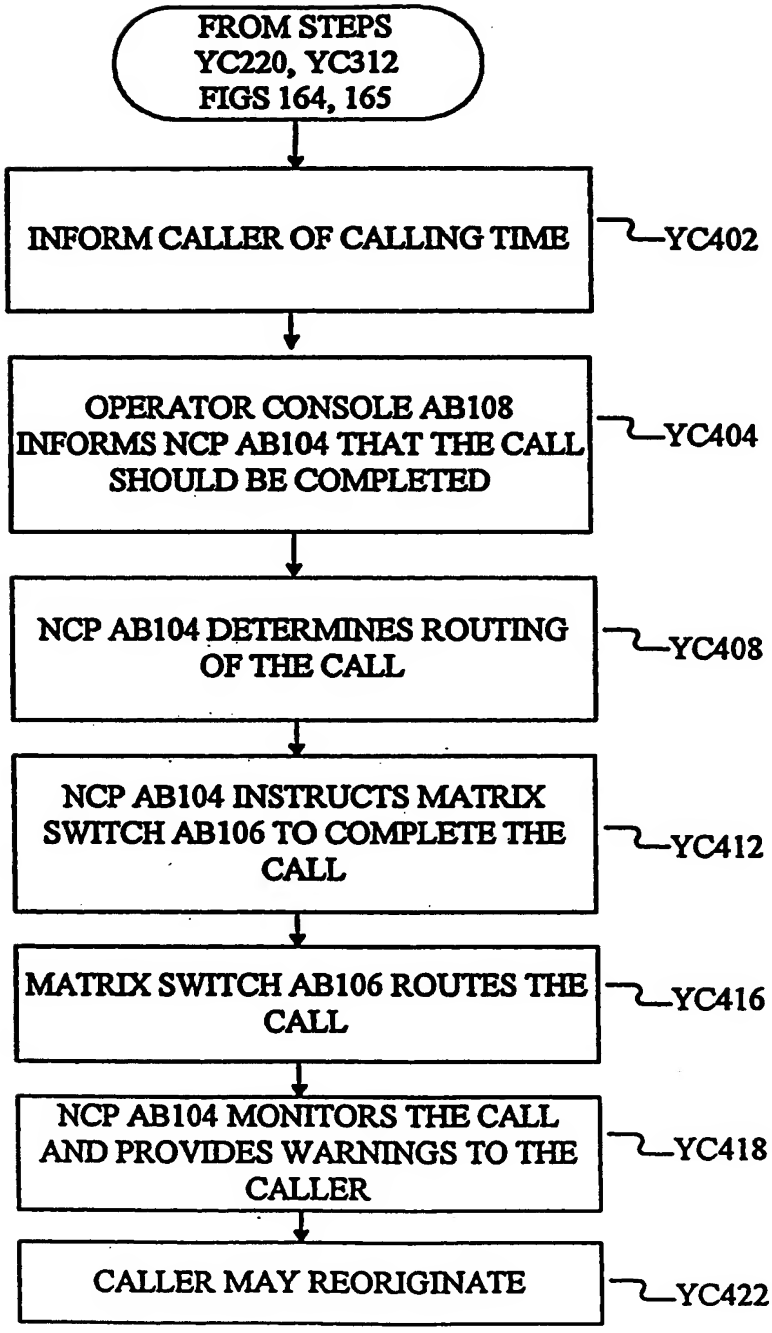

FROM STEPS YC220, YC312 FIGS 164, 165
INFORM CALLER OF CALLING TIME
YC402
OPERATOR CONSOLE AB108 INFORMS NCP AB104 THAT THE CALL SHOULD BE COMPLETED
YC404
NCP AB104 DETERMINES ROUTING OF THE CALL
YC408
NCP AB104 INSTRUCTS MATRIX SWITCH AB106 TO COMPLETE THE CALL
YC412
MATRIX SWITCH AB106 ROUTES THE CALL
YC416
NCP AB104 MONITORS THE CALL AND PROVIDES WARNINGS TO THE CALLER
YC418
CALLER MAY REORIGINATE
YC422

FIG 166

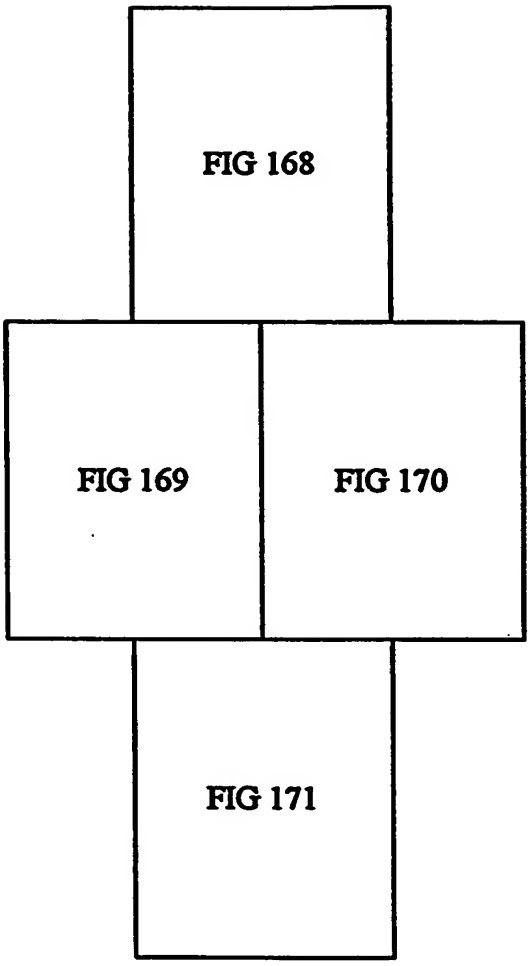


FIG 167

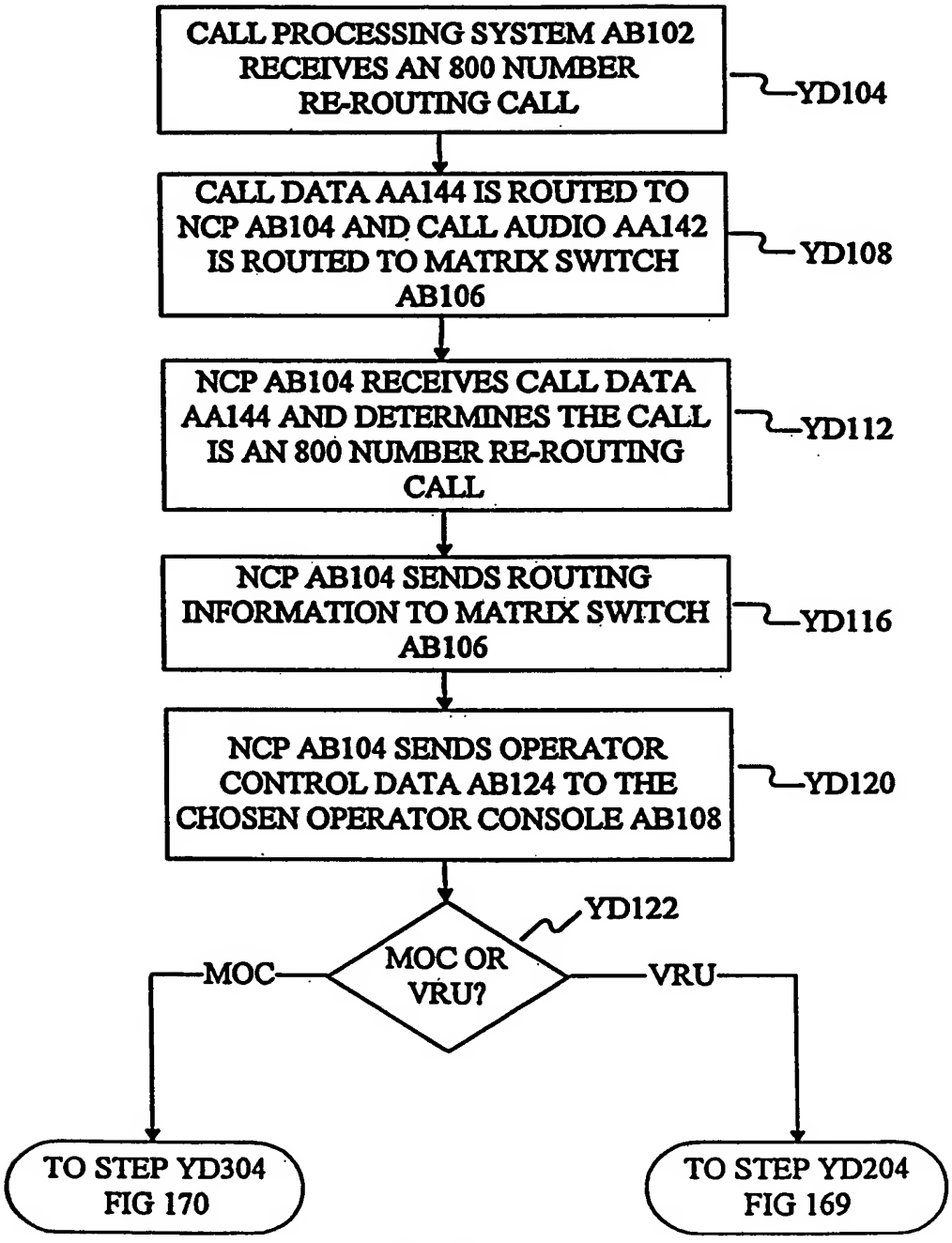

CALL PROCESSING SYSTEM AB102 RECEIVES AN 800 NUMBER RE-ROUTING CALL
YD104
CALL DATA AA144 IS ROUTED TO NCP AB104 AND CALL AUDIO AA142 IS ROUTED TO MATRIX SWITCH AB106
YD108
NCP AB104 RECEIVES CALL DATA AA144 AND DETERMINES THE CALL IS AN 800 NUMBER RE-ROUTING CALL
YD112
NCP AB104 SENDS ROUTING INFORMATION TO MATRIX SWITCH AB106
YD116
NCP AB104 SENDS OPERATOR CONTROL DATA AB124 TO THE CHOSEN OPERATOR CONSOLE AB108
YD120
YD122
MOC OR VRU?
MOC
VRU
TO STEP YD304 FIG 170
TO STEP YD204 FIG 169

FIG 168

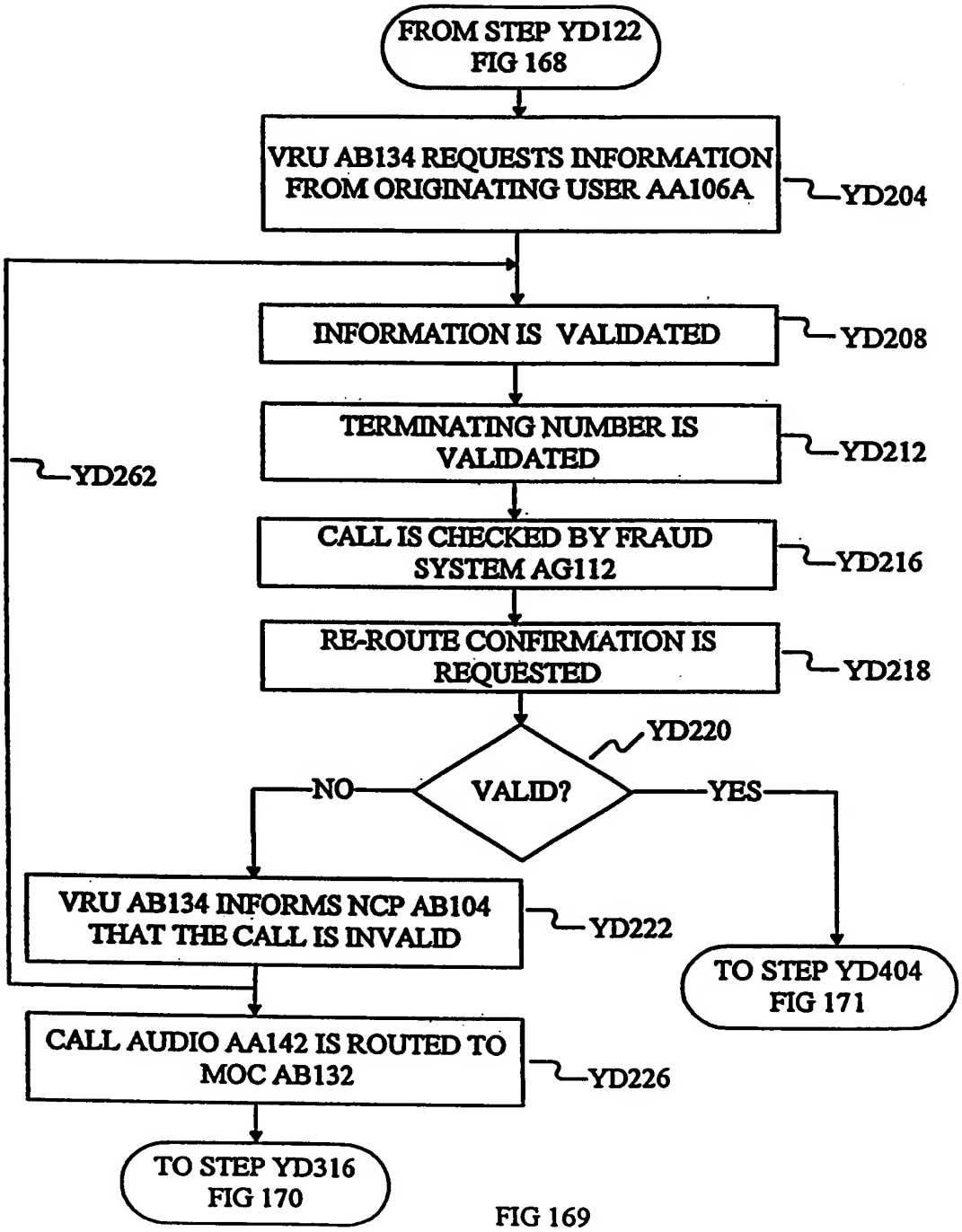

FROM STEP YD122
FIG 168
VRU AB134 REQUESTS INFORMATION FROM ORIGINATING USER AA106A
YD204
INFORMATION IS VALIDATED
YD208
TERMINATING NUMBER IS VALIDATED
YD212
YD262
CALL IS CHECKED BY FRAUD SYSTEM AG112
YD216
RE-ROUTE CONFIRMATION IS REQUESTED
YD218
YD220
VALID?
NO
YES
VRU AB134 INFORMS NCP AB104 THAT THE CALL IS INVALID
YD222
TO STEP YD404
FIG 171
CALL AUDIO AA142 IS ROUTED TO MOC AB132
YD226
TO STEP YD316
FIG 170

FIG 169

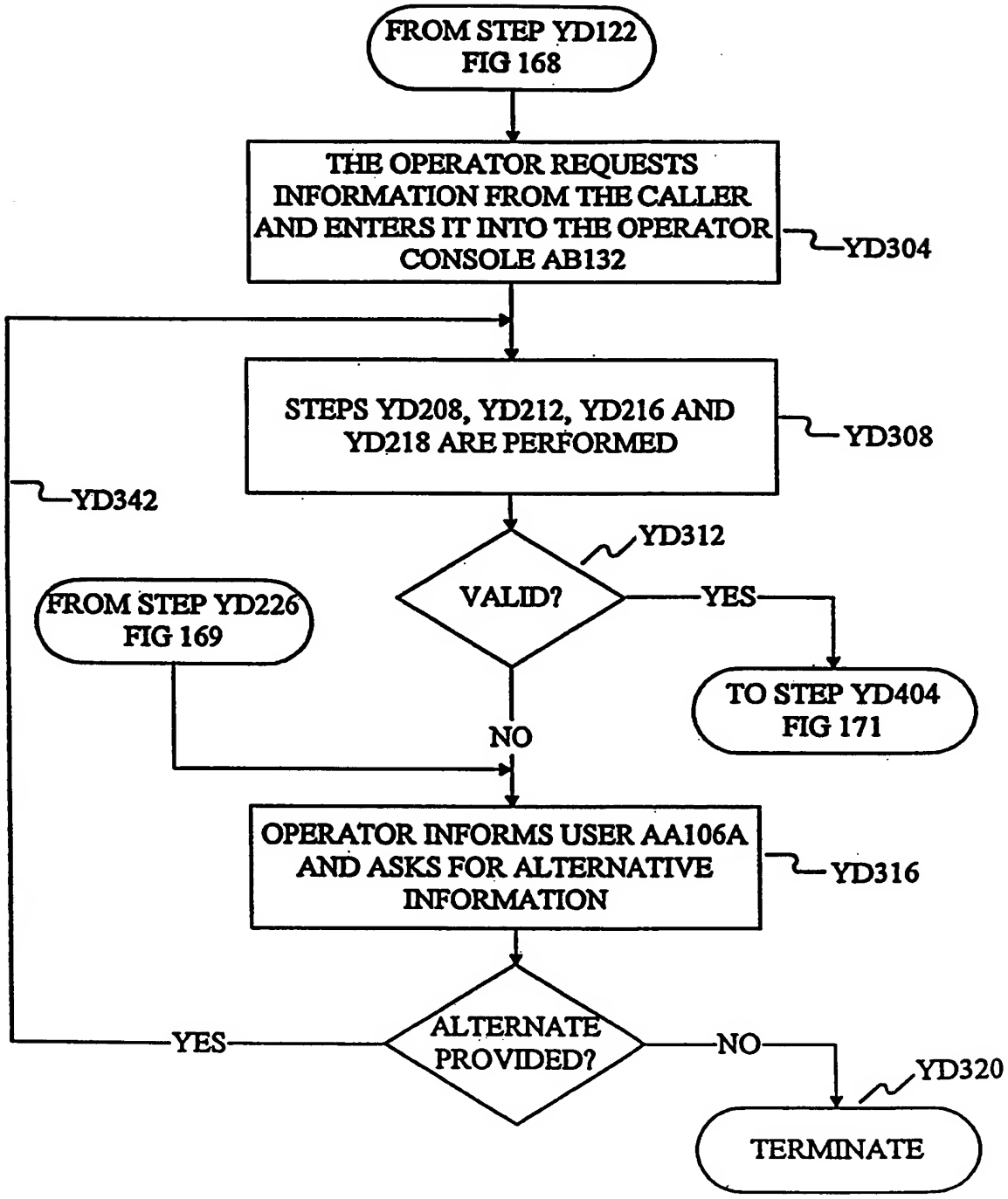

FROM STEP YD122
FIG 168
THE OPERATOR REQUESTS INFORMATION FROM THE CALLER AND ENTERS IT INTO THE OPERATOR CONSOLE AB132
YD304
STEPS YD208, YD212, YD216 AND YD218 ARE PERFORMED
YD308
YD342
YD312
VALID?
YES
FROM STEP YD226
FIG 169
TO STEP YD404
FIG 171
NO
OPERATOR INFORMS USER AA106A AND ASKS FOR ALTERNATIVE INFORMATION
YD316
ALTERNATE PROVIDED?
YES
NO
YD320
TERMINATE

FIG 170

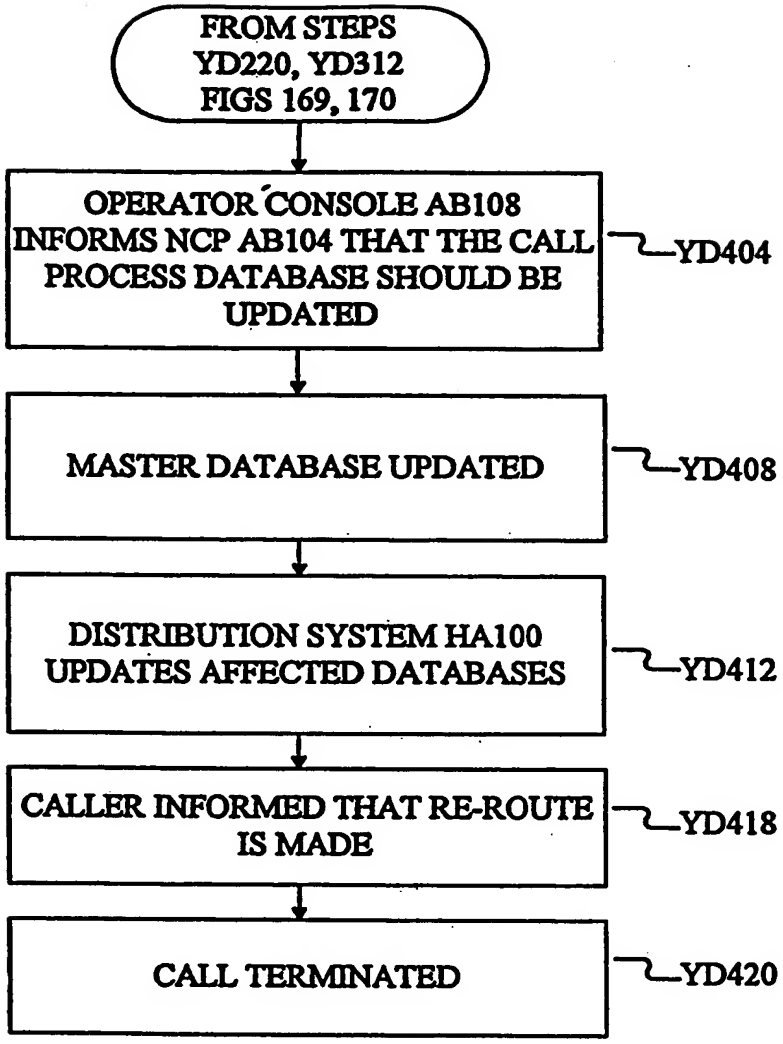

FROM STEPS
YD220, YD312
FIGS 169, 170
OPERATOR CONSOLE AB108 INFORMS NCP AB104 THAT THE CALL PROCESS DATABASE SHOULD BE UPDATED
YD404
MASTER DATABASE UPDATED
YD408
DISTRIBUTION SYSTEM HA100 UPDATES AFFECTED DATABASES
YD412
CALLER INFORMED THAT RE-ROUTE IS MADE
YD418
CALL TERMINATED
YD420

FIG 171

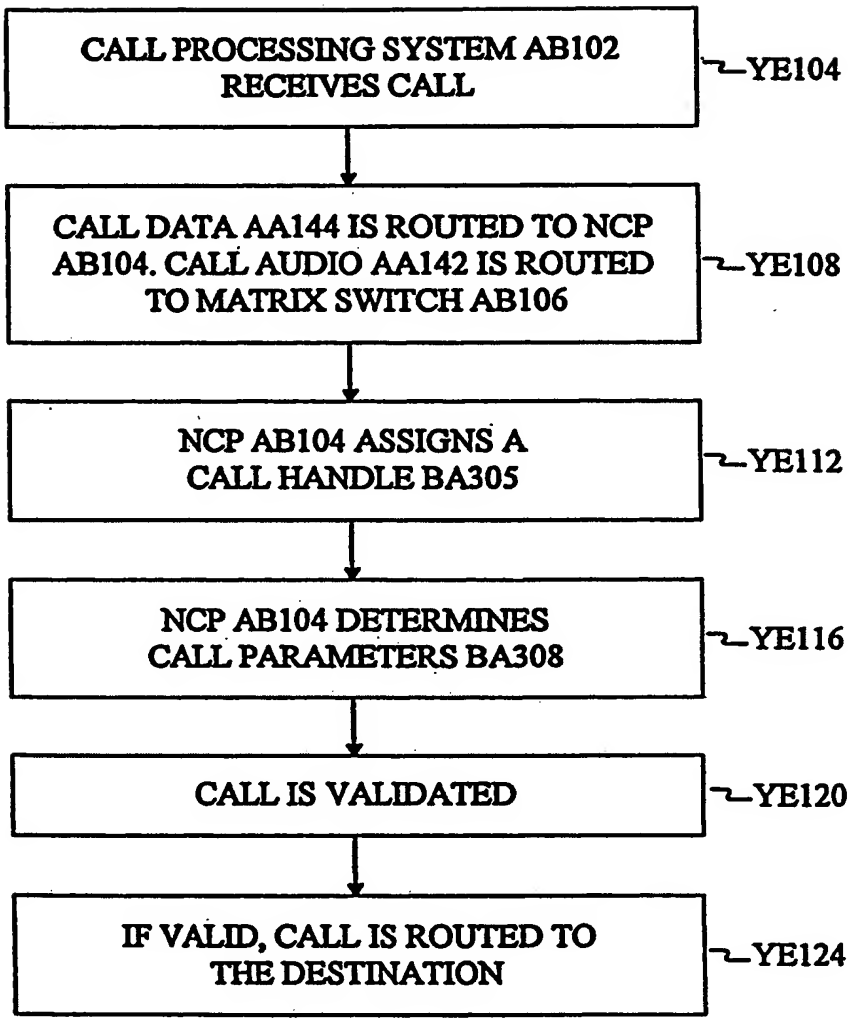

CALL PROCESSING SYSTEM AB102 RECEIVES CALL
YE104
CALL DATA AA144 IS ROUTED TO NCP AB104. CALL AUDIO AA142 IS ROUTED TO MATRIX SWITCH AB106
YE108
NCP AB104 ASSIGNS A CALL HANDLE BA305
YE112
NCP AB104 DETERMINES CALL PARAMETERS BA308
YE116
CALL IS VALIDATED
YE120
IF VALID, CALL IS ROUTED TO THE DESTINATION
YE124

FIG 172

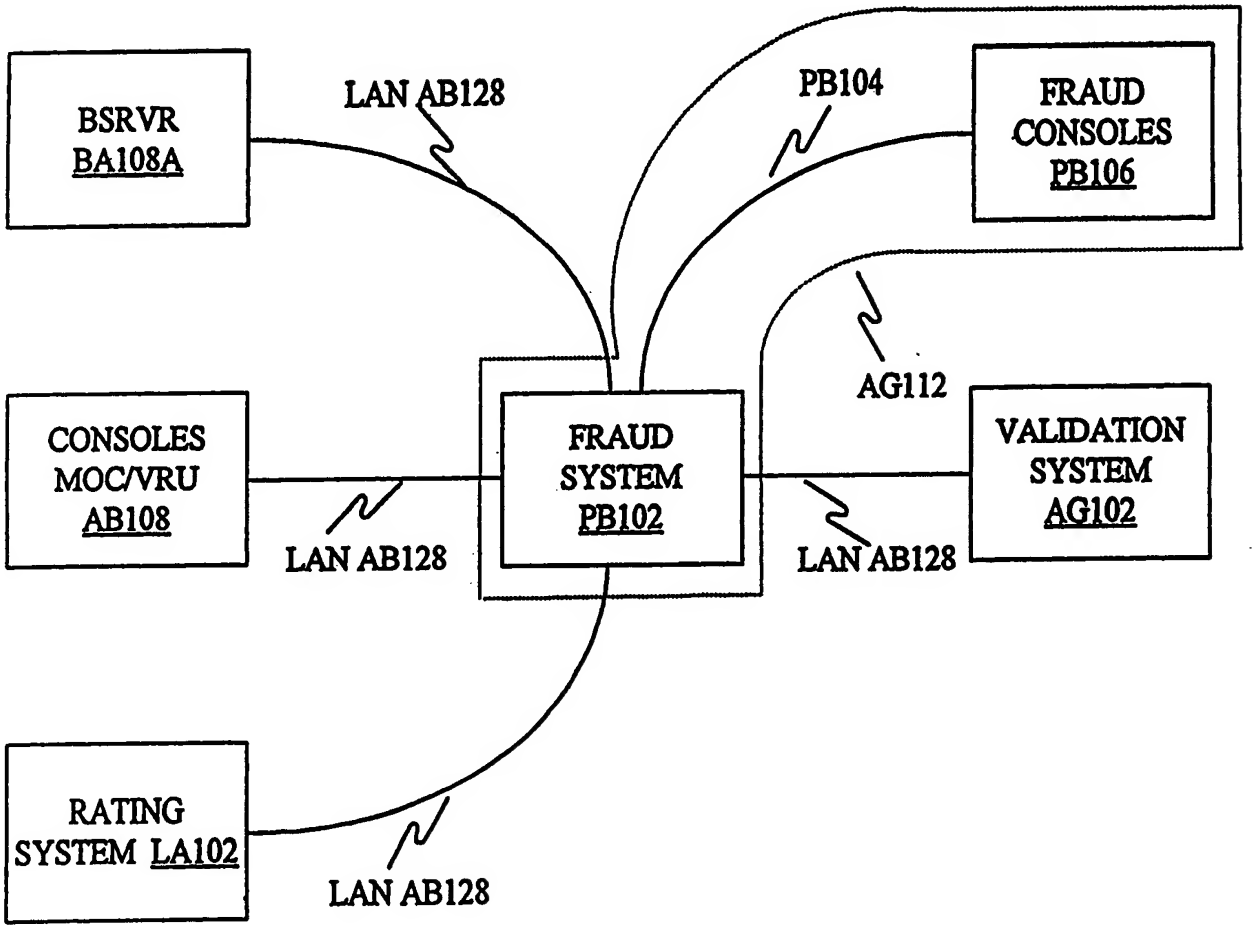

BSRVR
BA108A
LAN AB128
PB104
FRAUD
CONSOLES
PB106
AG112
CONSOLES
MOC/VRU
AB108
LAN AB128
FRAUD
SYSTEM
PB102
LAN AB128
VALIDATION
SYSTEM
AG102
RATING
SYSTEM LA102
LAN AB128

FIG 173

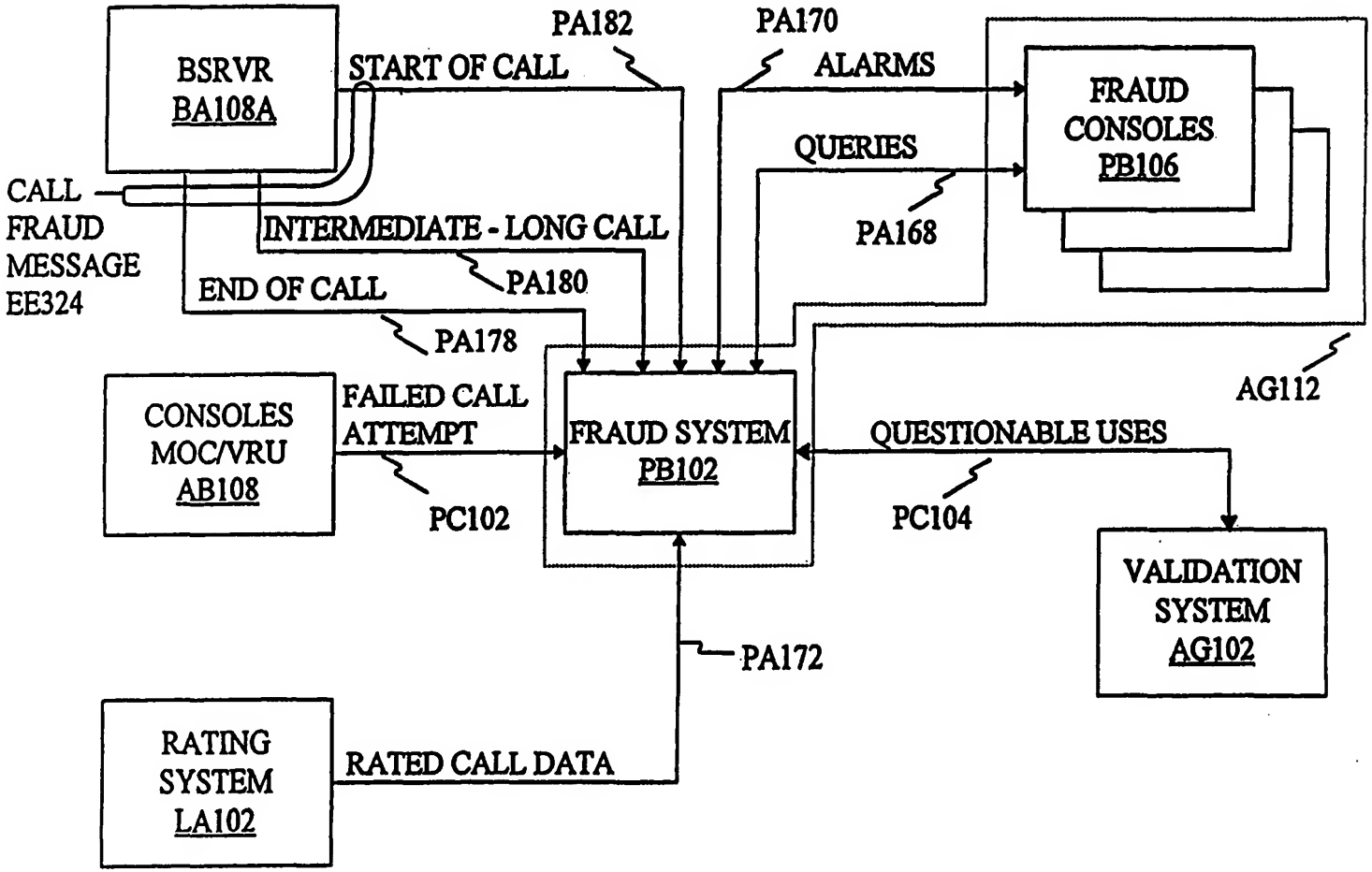

BSRVR
BA108A
START OF CALL
PA182
PA170
ALARMS
FRAUD
CONSOLES
PB106
QUERIES
PA168
CALL
FRAUD
MESSAGE
EE324
INTERMEDIATE - LONG CALL
PA180
END OF CALL
PA178
AG112
CONSOLES
MOC/VRU
AB108
FAILED CALL
ATTEMPT
PC102
FRAUD SYSTEM
PB102
QUESTIONABLE USES
PC104
VALIDATION
SYSTEM
AG102
PA172
RATING
SYSTEM
LA102
RATED CALL DATA

FIG 174

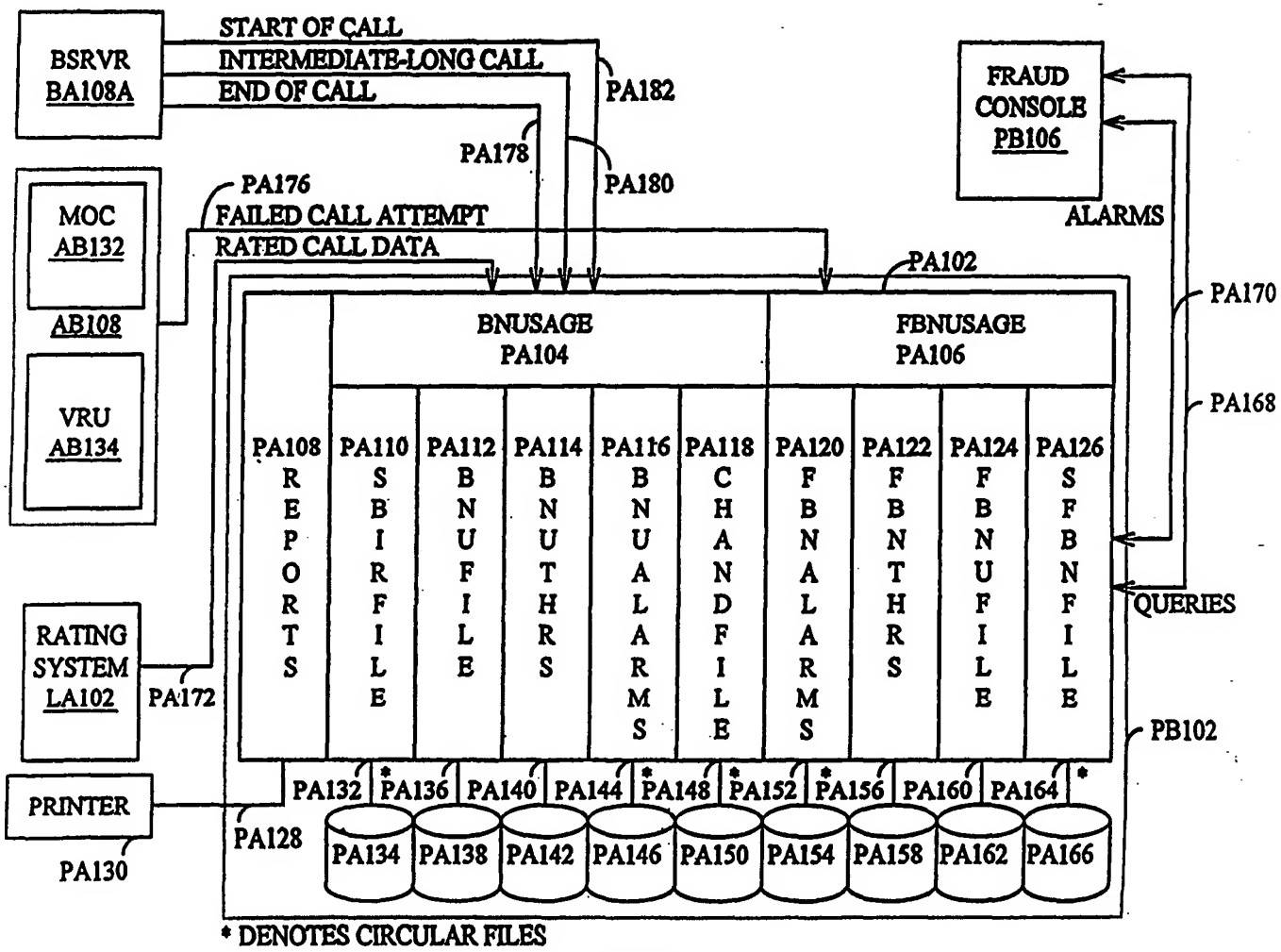

BSRVR
BA108A
START OF CALL
INTERMEDIATE-LONG CALL
END OF CALL
PA182
PA178
PA180
FRAUD
CONSOLE
PB106
ALARMS
MOC
AB132
AB108
VRU
AB134
PA176
FAILED CALL ATTEMPT
RATED CALL DATA
PA102
PA170
PA168
BNUSAGE
PA104
FBNUSAGE
PA106
PA108 REPORTS
PA110 SBIRFILE
PA112 BNUFILE
PA114 BNUTHRS
PA116 BNUALARMS
PA118 CHANDFILE
PA120 FBNALARMS
PA122 FBNTHRS
PA124 FBNUFILE
PA126 SFBNFILE
QUERIES
RATING
SYSTEM
LA102
PA172
PB102
PRINTER
PA130
PA128
PA132
PA136
PA140
PA144
PA148
PA152
PA156
PA160
PA164
PA134
PA138
PA142
PA146
PA150
PA154
PA158
PA162
PA166
* DENOTES CIRCULAR FILES

FIG 175

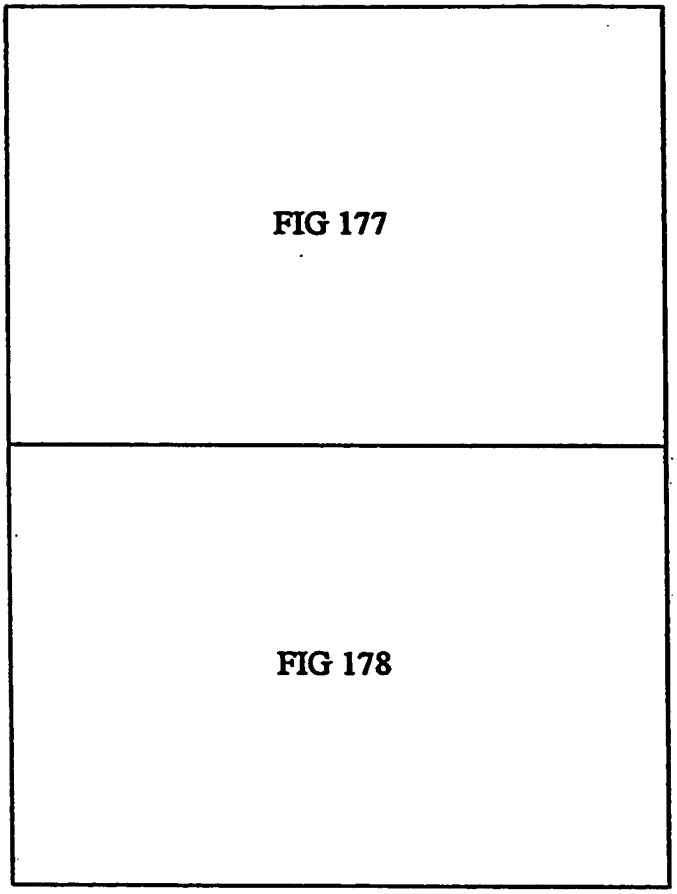


FIG 176

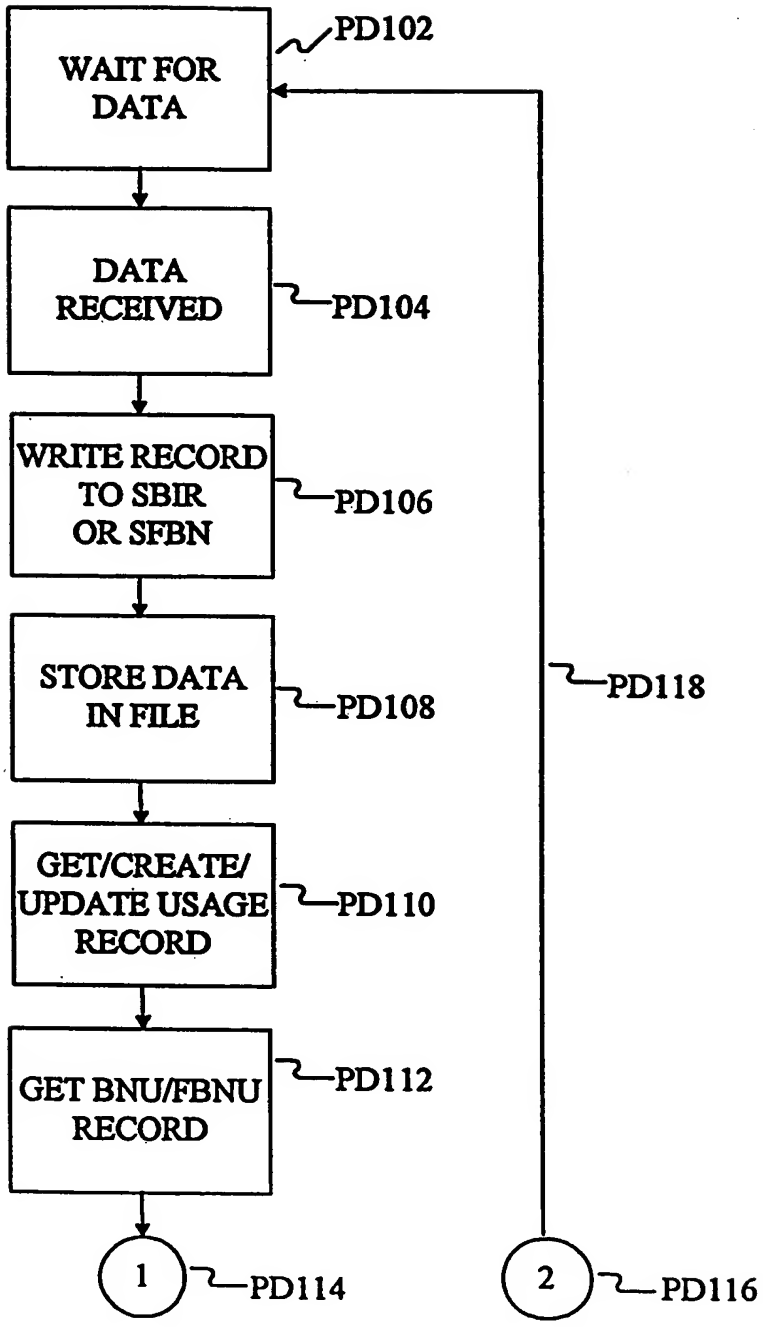

WAIT FOR DATA
PD102
DATA RECEIVED
PD104
WRITE RECORD TO SBIR OR SFBN
PD106
STORE DATA IN FILE
PD108
GET/CREATE/ UPDATE USAGE RECORD
PD110
GET BNU/FBNU RECORD
PD112
1
PD114
2
PD116
PD118

FIG 177

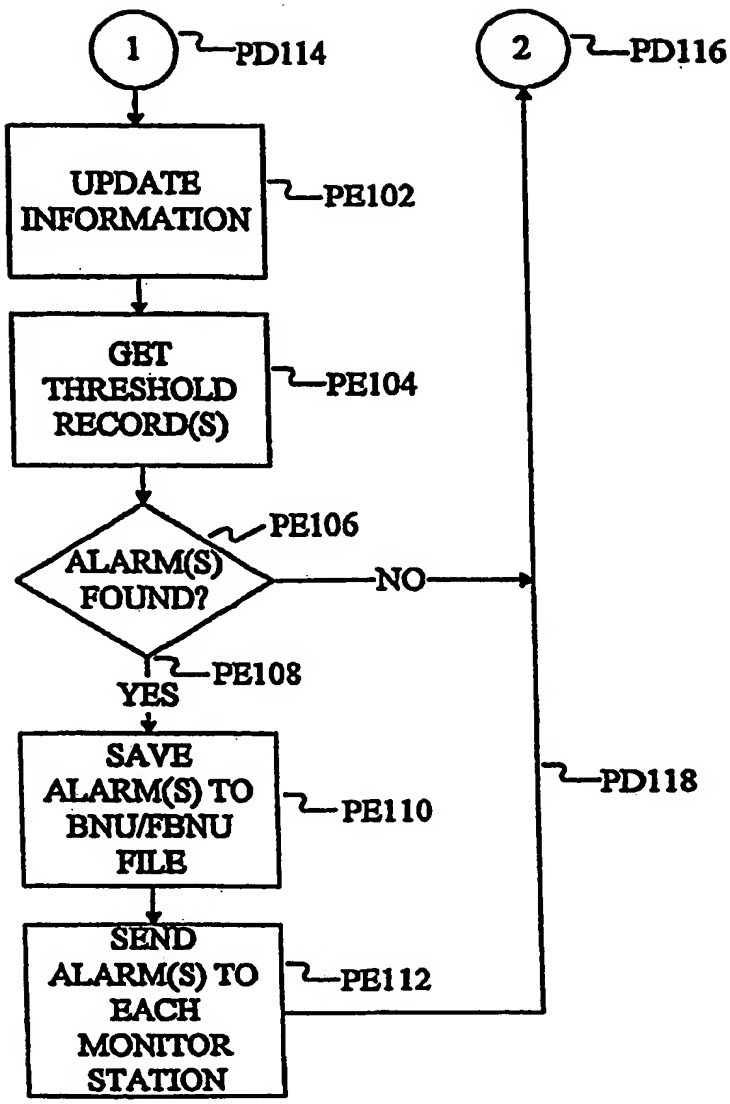

1
PD114
2
PD116
UPDATE INFORMATION
PE102
GET THRESHOLD RECORD(S)
PE104
PE106
ALARM(S) FOUND?
NO
PE108
YES
SAVE ALARM(S) TO BNU/FBNU FILE
PE110
PD118
SEND ALARM(S) TO EACH MONITOR STATION
PE112

FIG 178

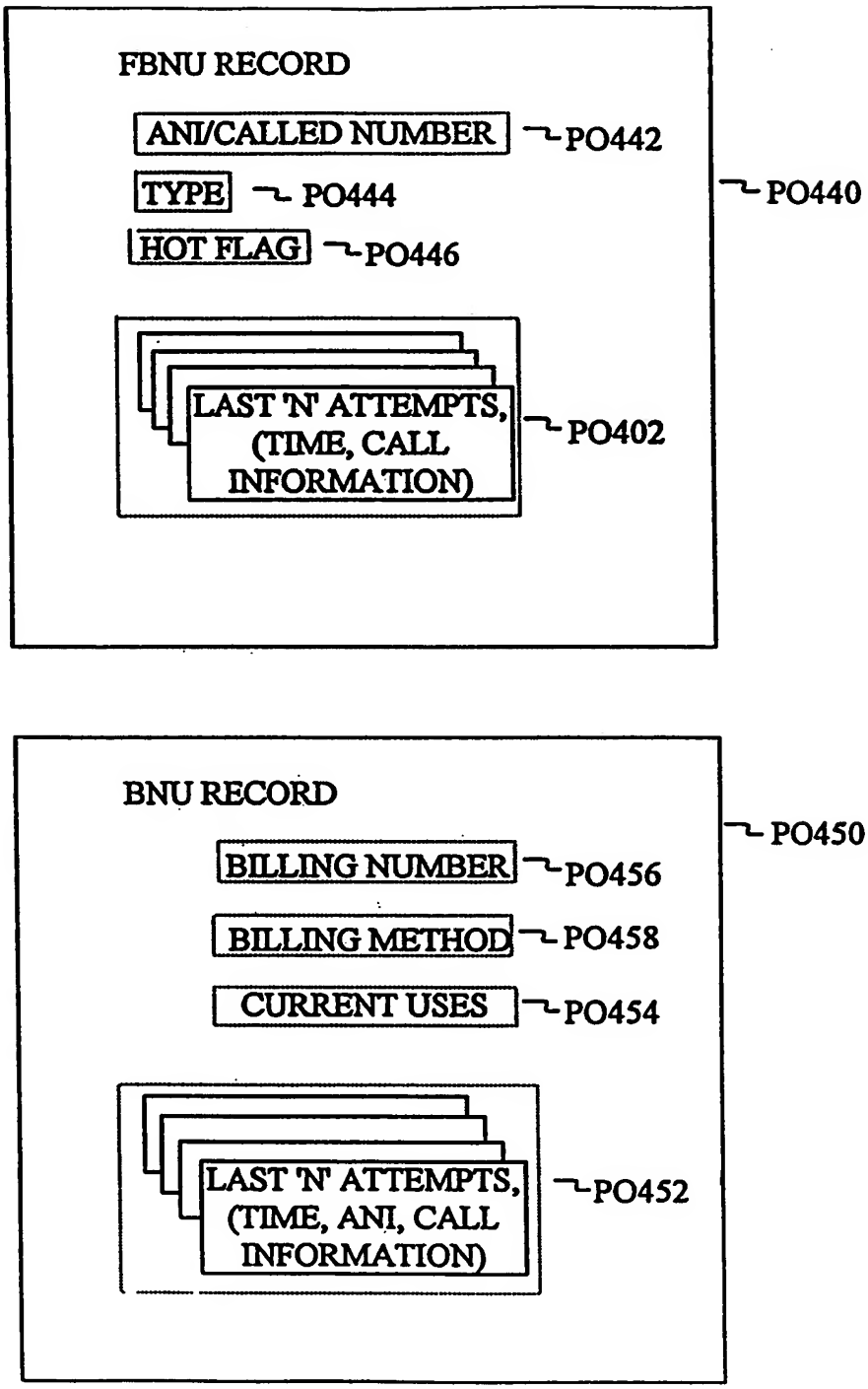

FBNU RECORD
ANI/CALLED NUMBER
PO442
TYPE
PO444
HOT FLAG
PO446
PO440
LAST 'N' ATTEMPTS, (TIME, CALL INFORMATION)
PO402
BNU RECORD
PO450
BILLING NUMBER
PO456
BILLING METHOD
PO458
CURRENT USES
PO454
LAST 'N' ATTEMPTS, (TIME, ANI, CALL INFORMATION)
PO452

FIG 179

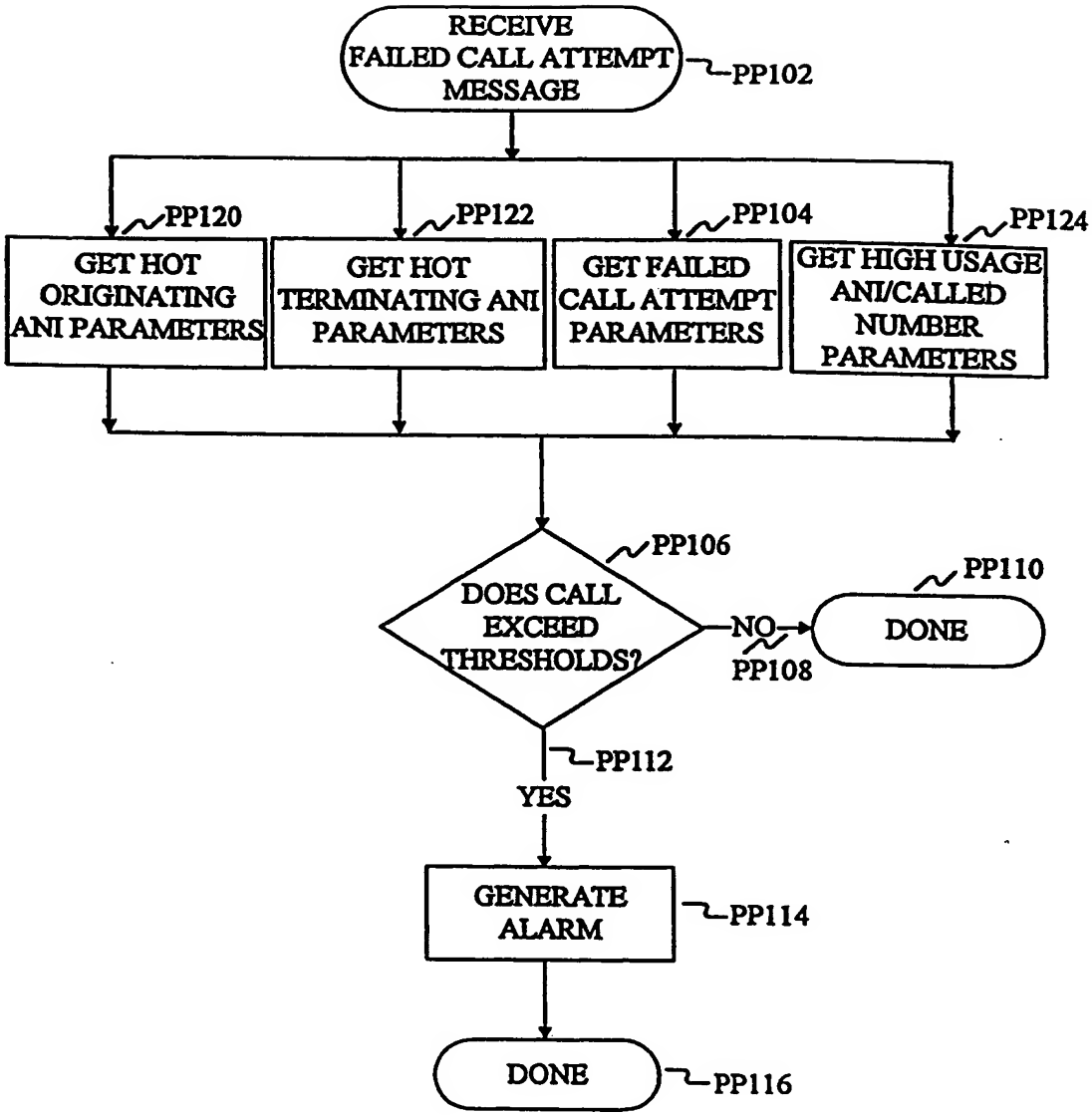

RECEIVE FAILED CALL ATTEMPT MESSAGE
PP102
PP120
PP122
PP104
PP124
GET HOT ORIGINATING ANI PARAMETERS
GET HOT TERMINATING ANI PARAMETERS
GET FAILED CALL ATTEMPT PARAMETERS
GET HIGH USAGE ANI/CALLED NUMBER PARAMETERS
PP106
DOES CALL EXCEED THRESHOLDS?
NO
PP108
PP110
DONE
PP112
YES
GENERATE ALARM
PP114
DONE
PP116

FIG 180

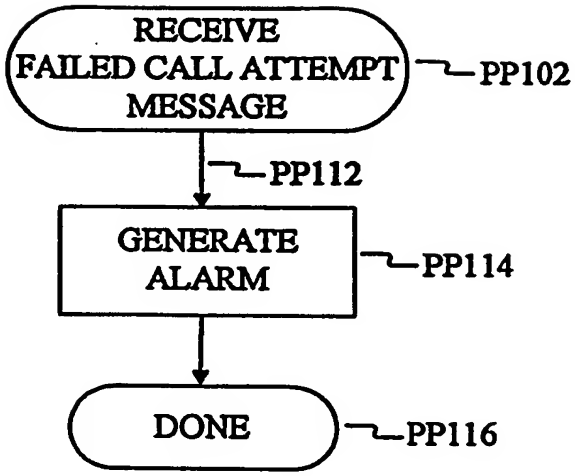

RECEIVE FAILED CALL ATTEMPT MESSAGE
PP102
PP112
GENERATE ALARM
PP114
DONE
PP116

FIG 181

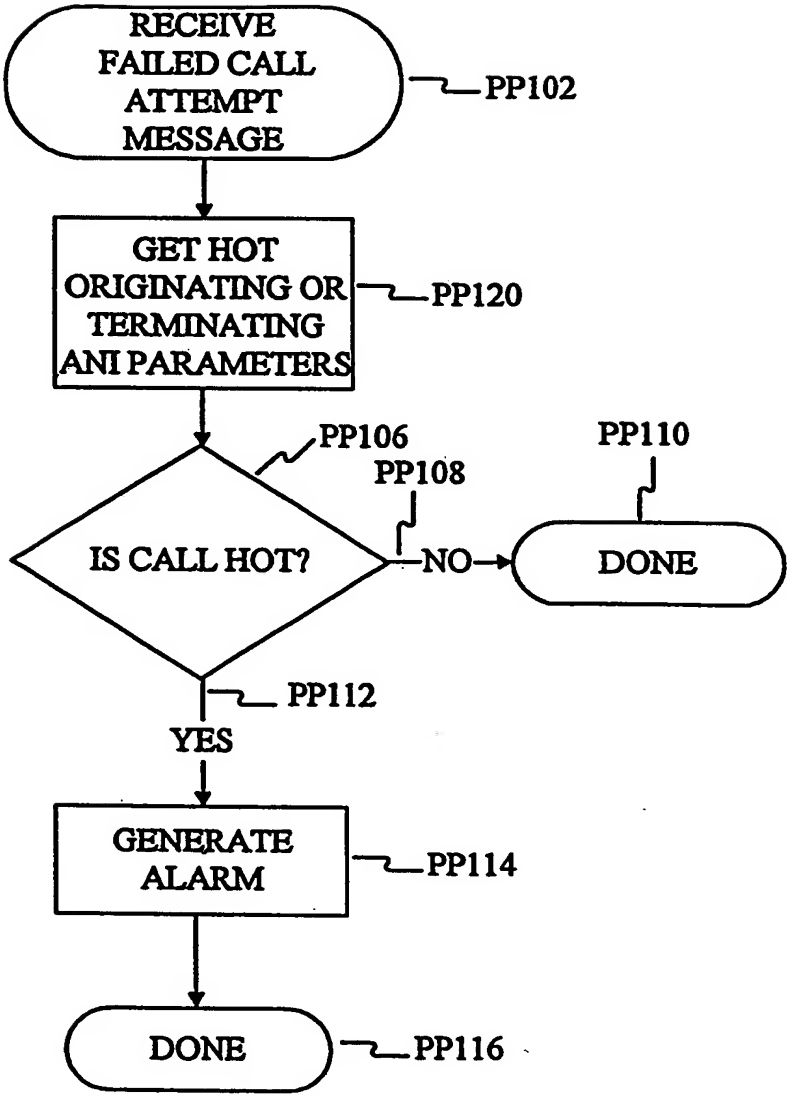

RECEIVE FAILED CALL ATTEMPT MESSAGE
PP102
GET HOT ORIGINATING OR TERMINATING ANI PARAMETERS
PP120
PP106
PP108
PP110
IS CALL HOT?
NO
DONE
PP112
YES
GENERATE ALARM
PP114
DONE
PP116

FIG 182

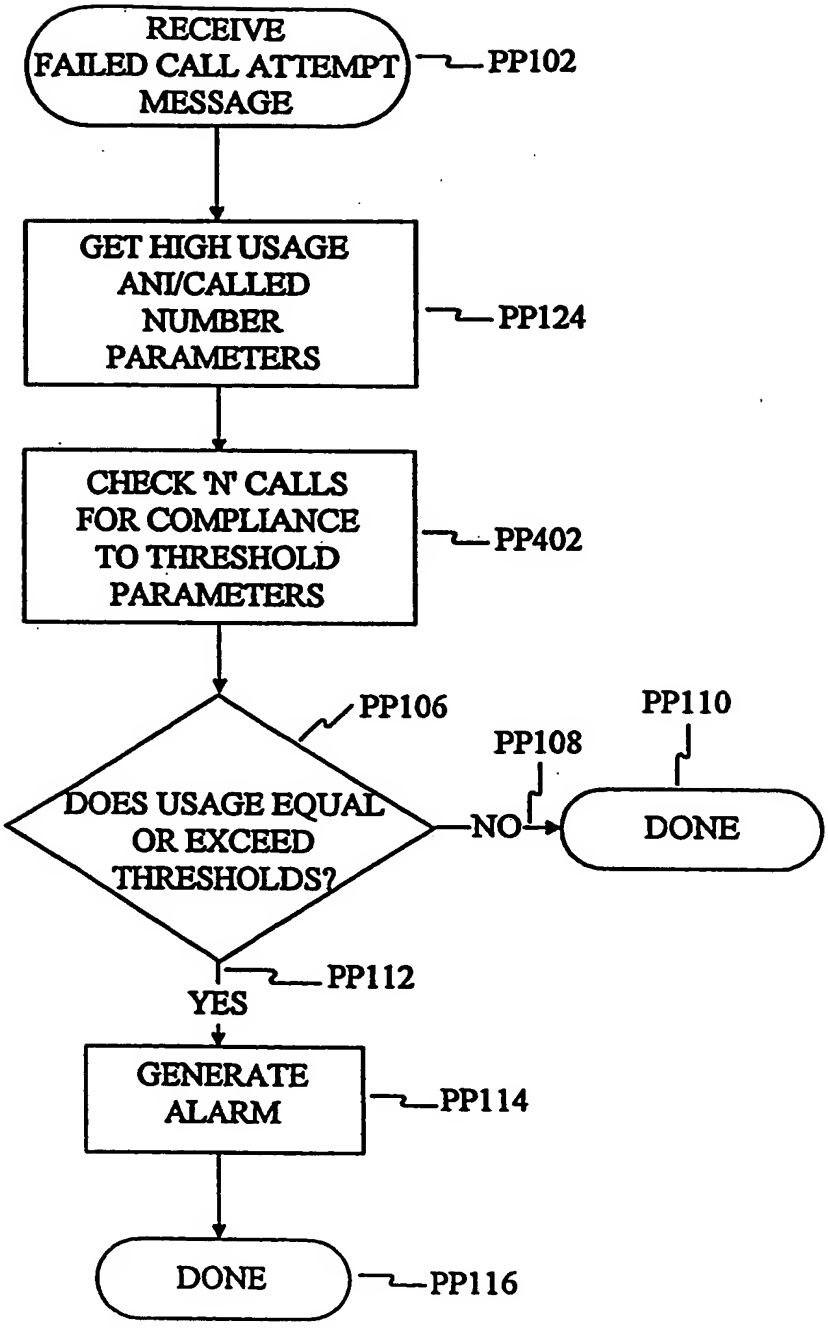

RECEIVE FAILED CALL ATTEMPT MESSAGE
PP102
GET HIGH USAGE ANI/CALLED NUMBER PARAMETERS
PP124
CHECK 'N' CALLS FOR COMPLIANCE TO THRESHOLD PARAMETERS
PP402
PP106
DOES USAGE EQUAL OR EXCEED THRESHOLDS?
PP108
NO
PP110
DONE
PP112
YES
GENERATE ALARM
PP114
DONE
PP116

FIG 183

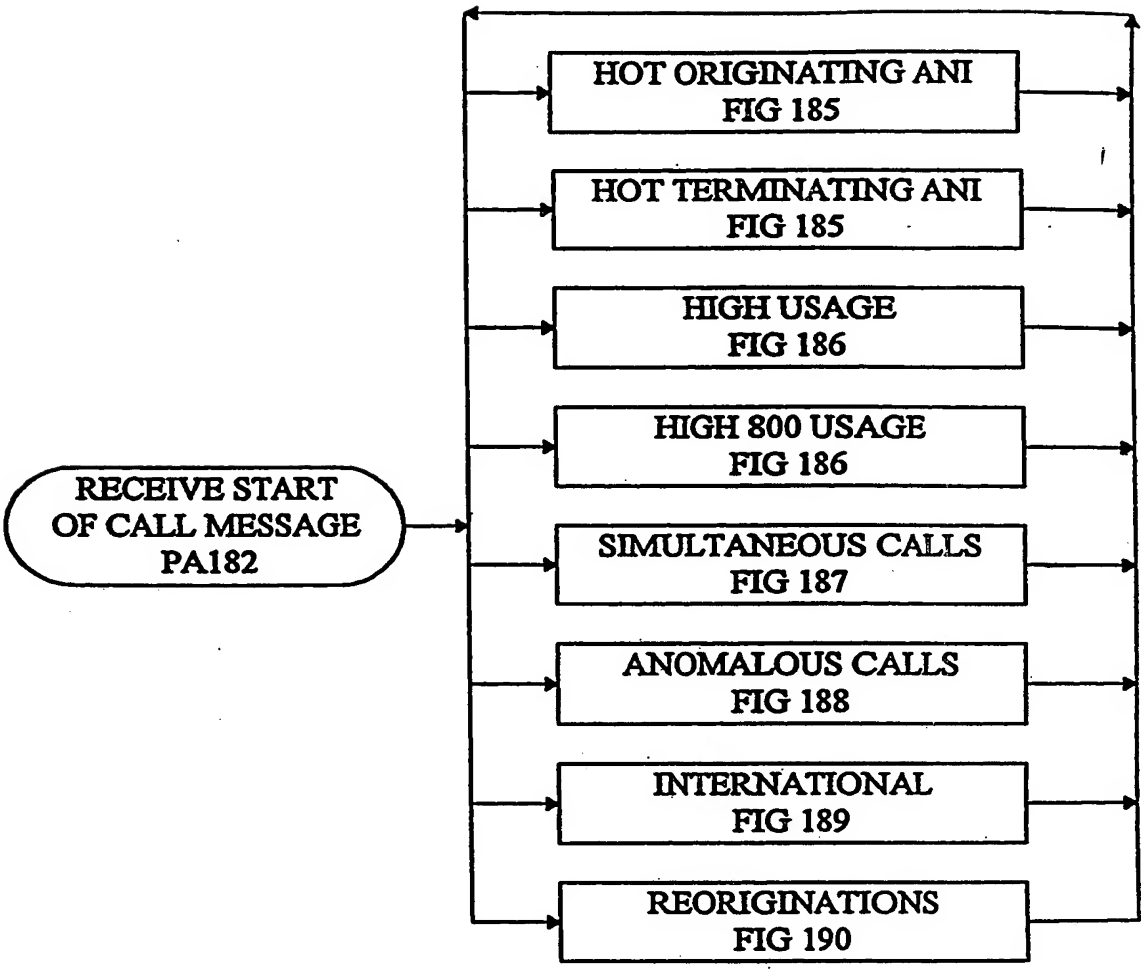

RECEIVE START OF CALL MESSAGE PA182
HOT ORIGINATING ANI FIG 185
HOT TERMINATING ANI FIG 185
HIGH USAGE FIG 186
HIGH 800 USAGE FIG 186
SIMULTANEOUS CALLS FIG 187
ANOMALOUS CALLS FIG 188
INTERNATIONAL FIG 189
REORIGINATIONS FIG 190

FIG 184

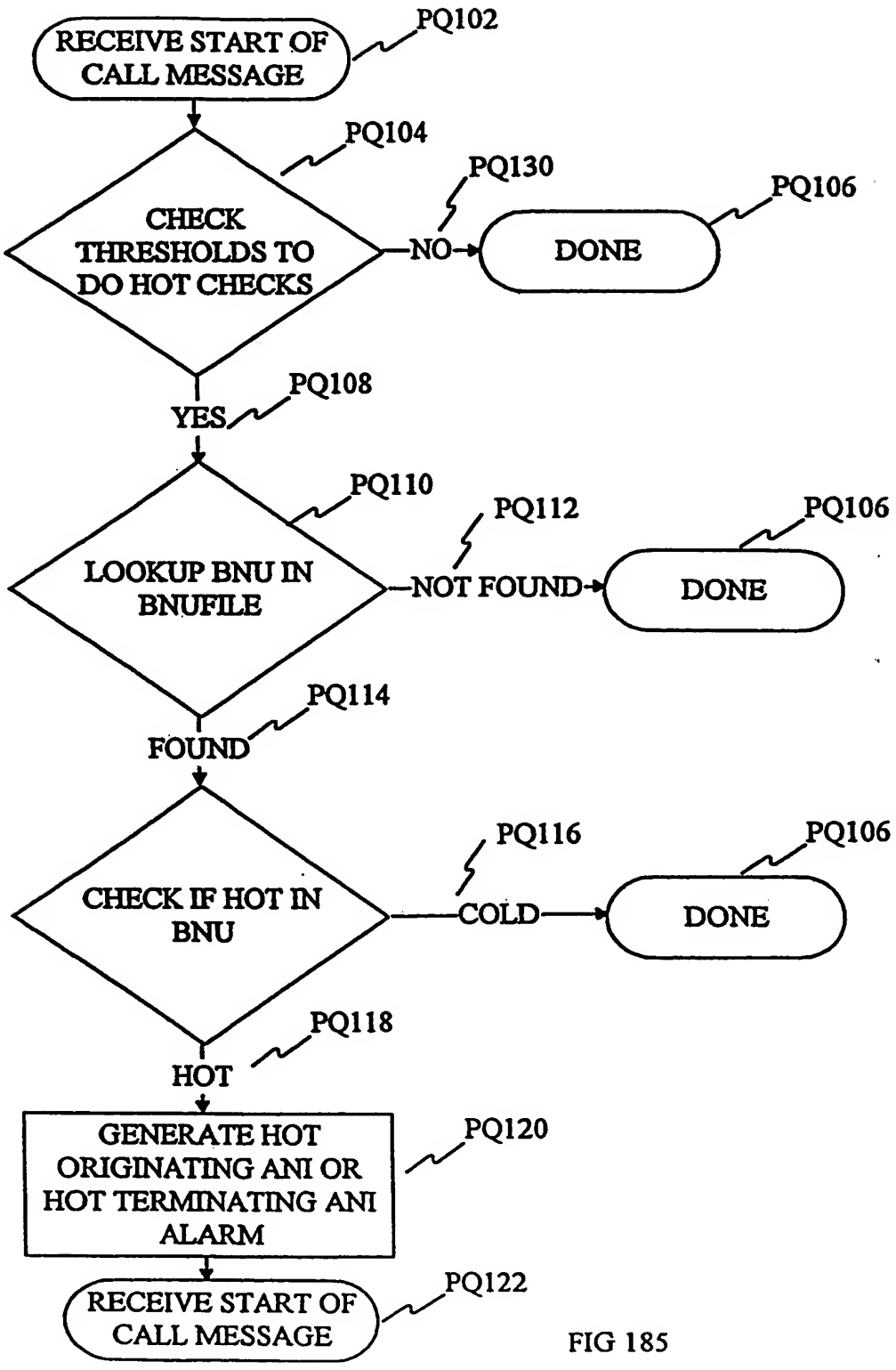

RECEIVE START OF CALL MESSAGE
PQ102
PQ104
CHECK THRESHOLDS TO DO HOT CHECKS
PQ130
NO
DONE
PQ106
YES
PQ108
PQ110
LOOKUP BNU IN BNUFILE
PQ112
NOT FOUND
DONE
PQ106
FOUND
PQ114
CHECK IF HOT IN BNU
PQ116
COLD
DONE
PQ106
HOT
PQ118
GENERATE HOT ORIGINATING ANI OR HOT TERMINATING ANI ALARM
PQ120
RECEIVE START OF CALL MESSAGE
PQ122

FIG 185

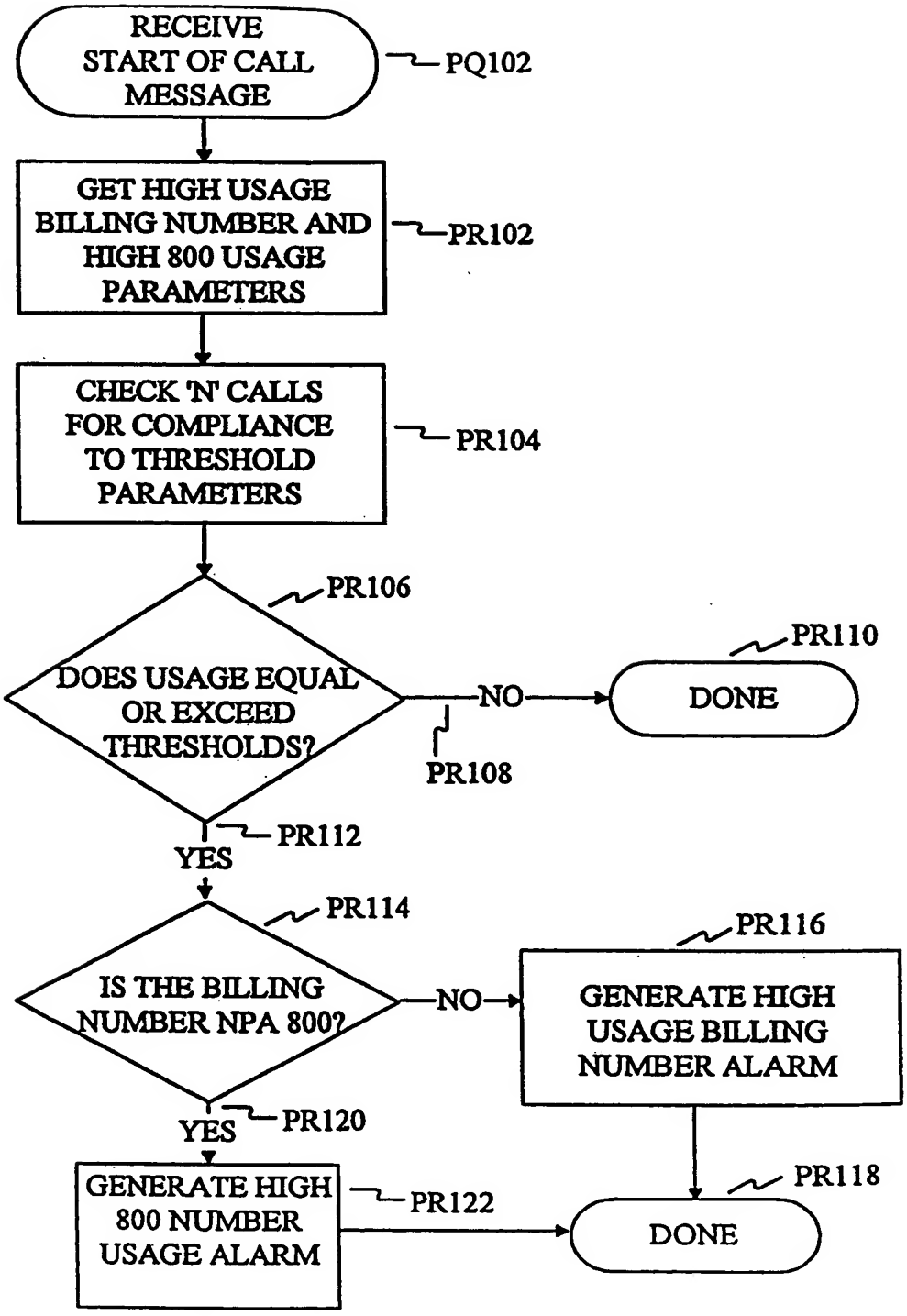

RECEIVE START OF CALL MESSAGE
PQ102
GET HIGH USAGE BILLING NUMBER AND HIGH 800 USAGE PARAMETERS
PR102
CHECK 'N' CALLS FOR COMPLIANCE TO THRESHOLD PARAMETERS
PR104
PR106
DOES USAGE EQUAL OR EXCEED THRESHOLDS?
NO
PR110
DONE
PR108
YES
PR112
PR114
IS THE BILLING NUMBER NPA 800?
NO
PR116
GENERATE HIGH USAGE BILLING NUMBER ALARM
YES
PR120
GENERATE HIGH 800 NUMBER USAGE ALARM
PR122
PR118
DONE

FIG 186

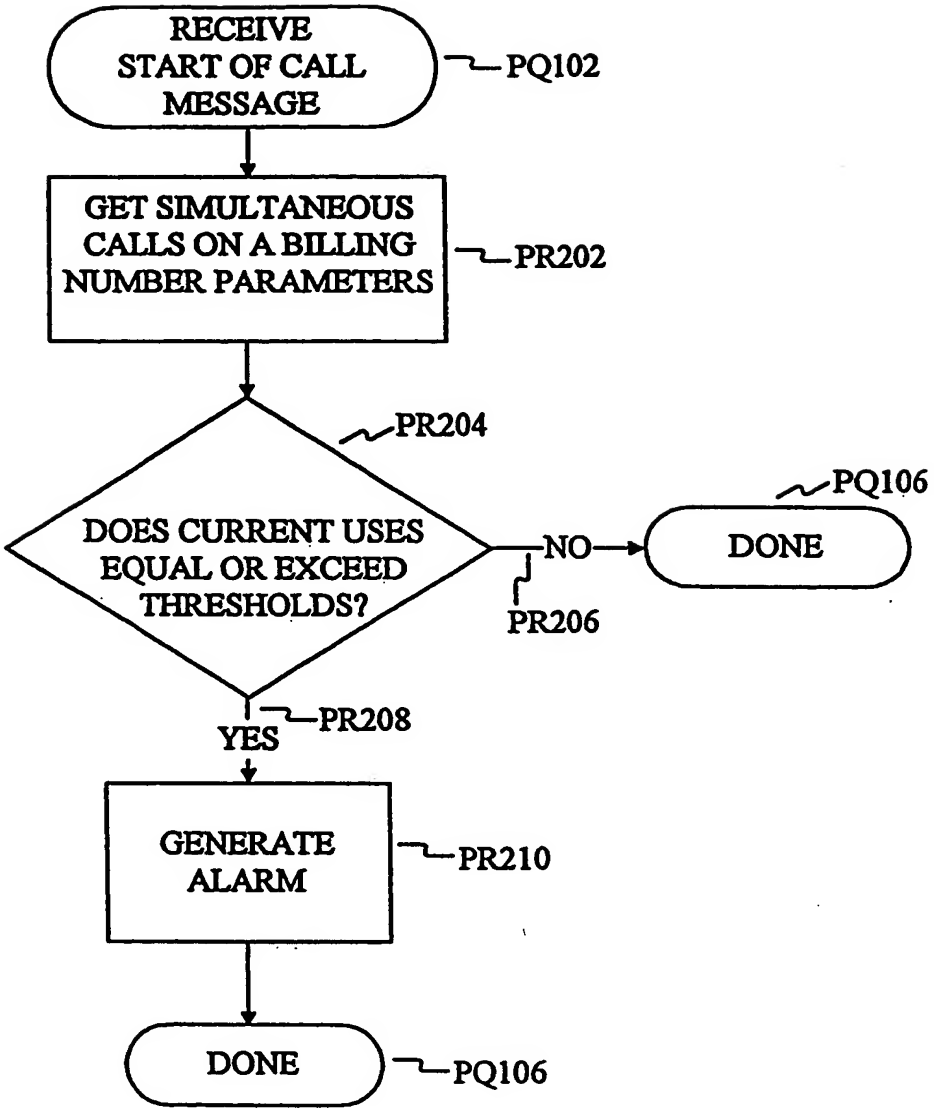

RECEIVE START OF CALL MESSAGE
PQ102
GET SIMULTANEOUS CALLS ON A BILLING NUMBER PARAMETERS
PR202
PR204
DOES CURRENT USES EQUAL OR EXCEED THRESHOLDS?
NO
PQ106
DONE
PR206
YES
PR208
GENERATE ALARM
PR210
DONE
PQ106

FIG 187

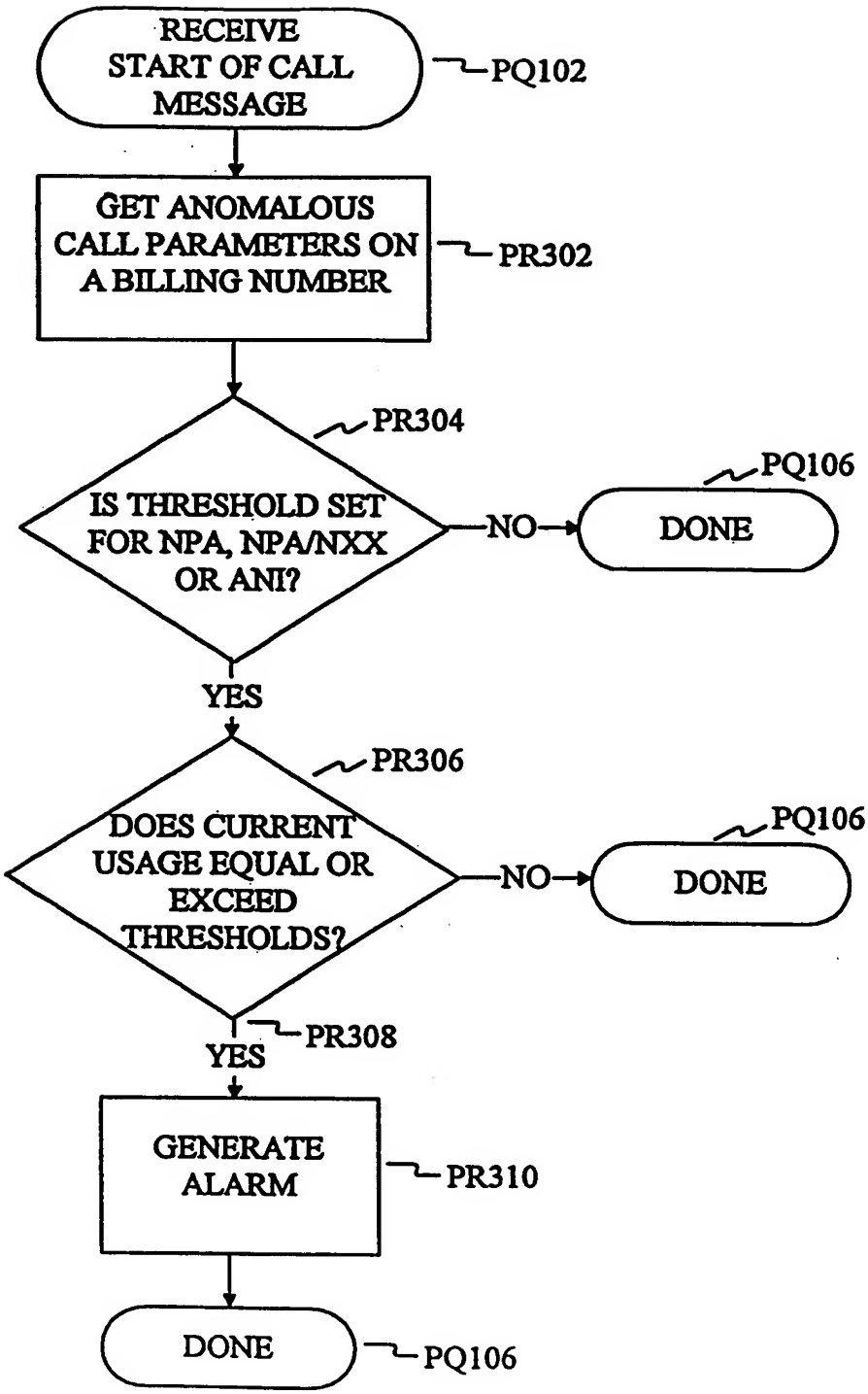

RECEIVE START OF CALL MESSAGE
PQ102
GET ANOMALOUS CALL PARAMETERS ON A BILLING NUMBER
PR302
PR304
IS THRESHOLD SET FOR NPA, NPA/NXX OR ANI?
NO
PQ106
DONE
YES
PR306
DOES CURRENT USAGE EQUAL OR EXCEED THRESHOLDS?
NO
PQ106
DONE
YES
PR308
GENERATE ALARM
PR310
DONE
PQ106

FIG 188

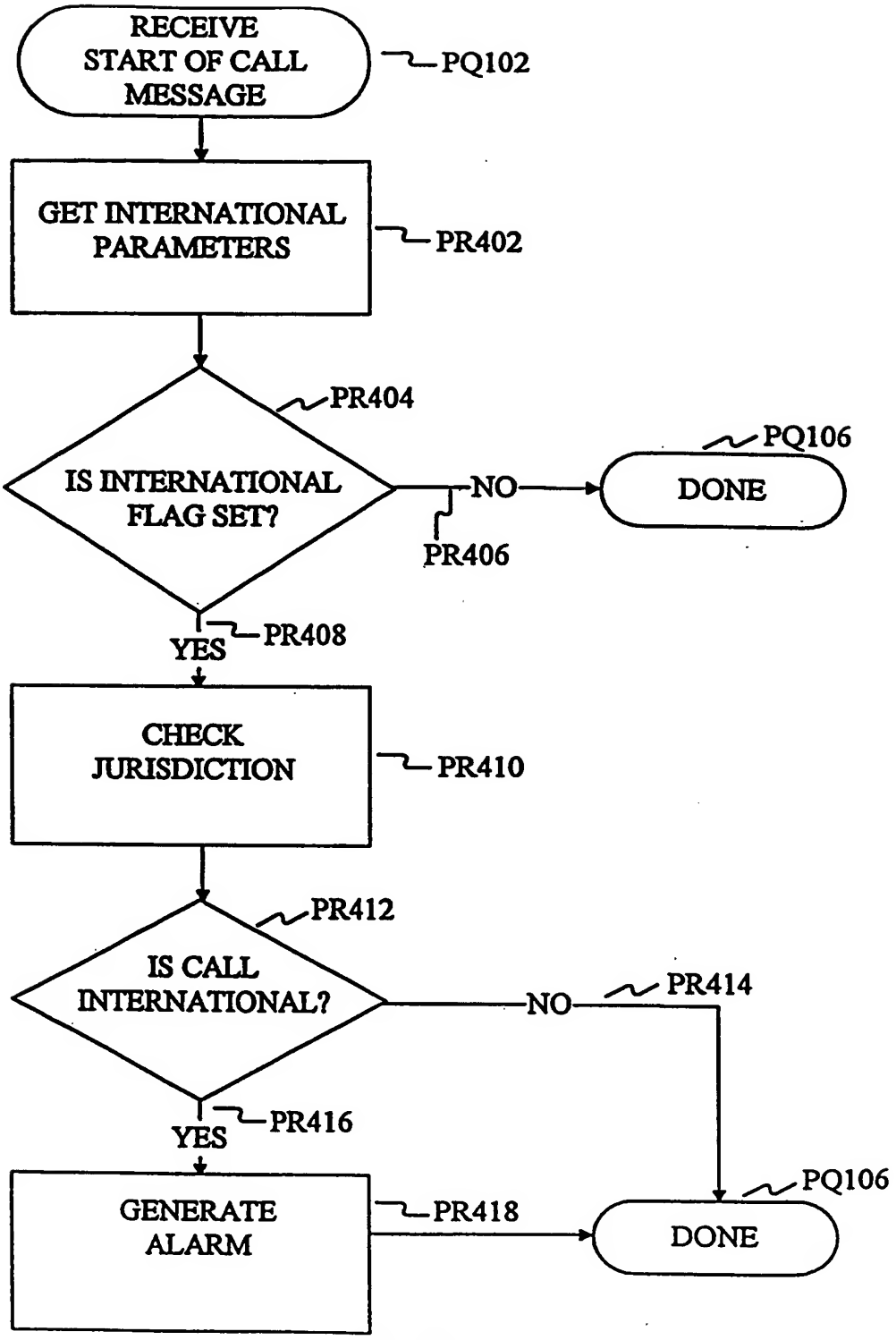

RECEIVE START OF CALL MESSAGE
PQ102
GET INTERNATIONAL PARAMETERS
PR402
PR404
IS INTERNATIONAL FLAG SET?
NO
PQ106
DONE
PR406
YES
PR408
CHECK JURISDICTION
PR410
PR412
IS CALL INTERNATIONAL?
NO
PR414
YES
PR416
GENERATE ALARM
PR418
PQ106
DONE

FIG 189

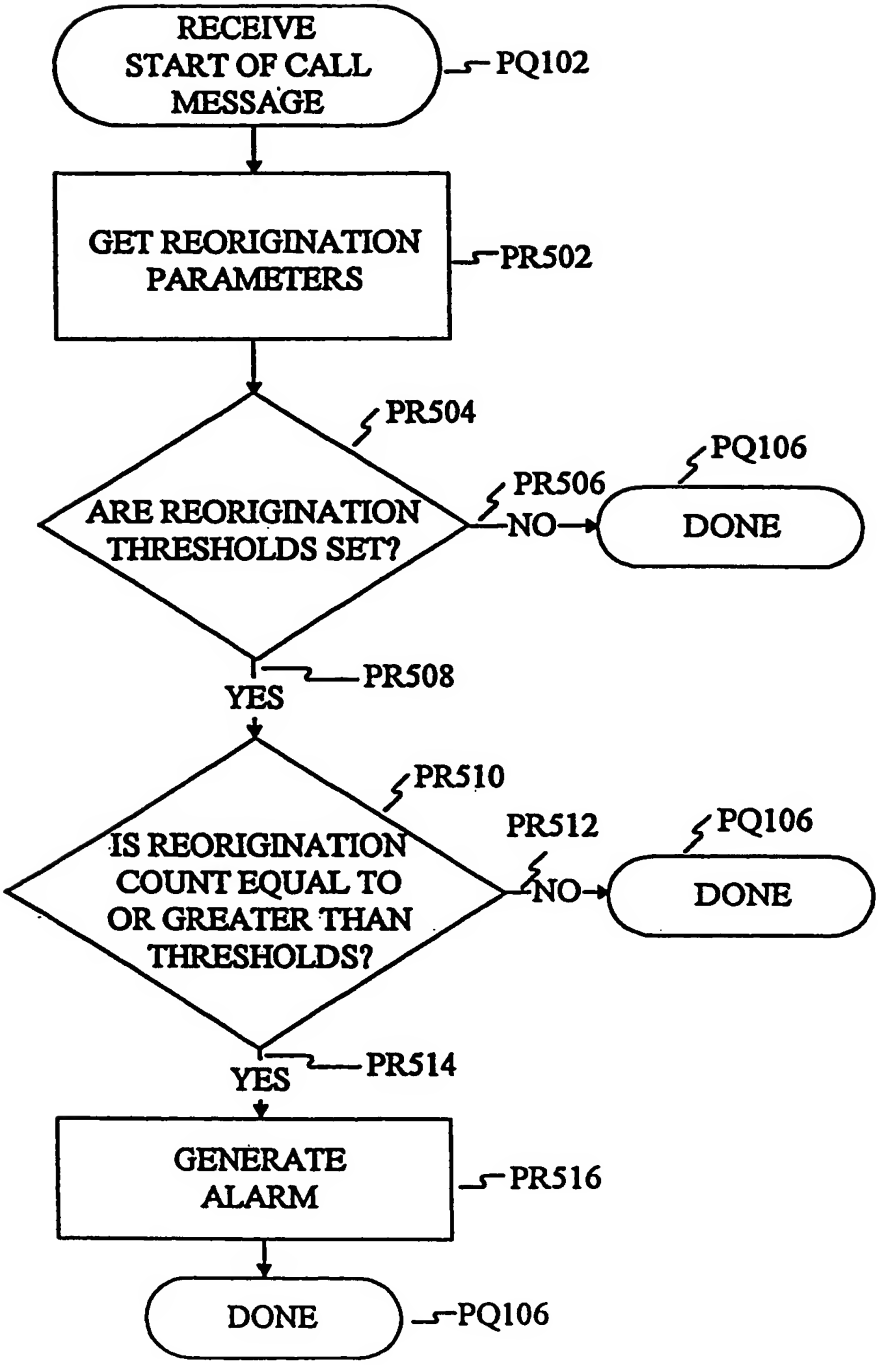

RECEIVE START OF CALL MESSAGE
PQ102
GET REORIGINATION PARAMETERS
PR502
PR504
ARE REORIGINATION THRESHOLDS SET?
PR506
NO
PQ106
DONE
YES
PR508
PR510
IS REORIGINATION COUNT EQUAL TO OR GREATER THAN THRESHOLDS?
PR512
NO
PQ106
DONE
YES
PR514
GENERATE ALARM
PR516
DONE
PQ106

FIG 190

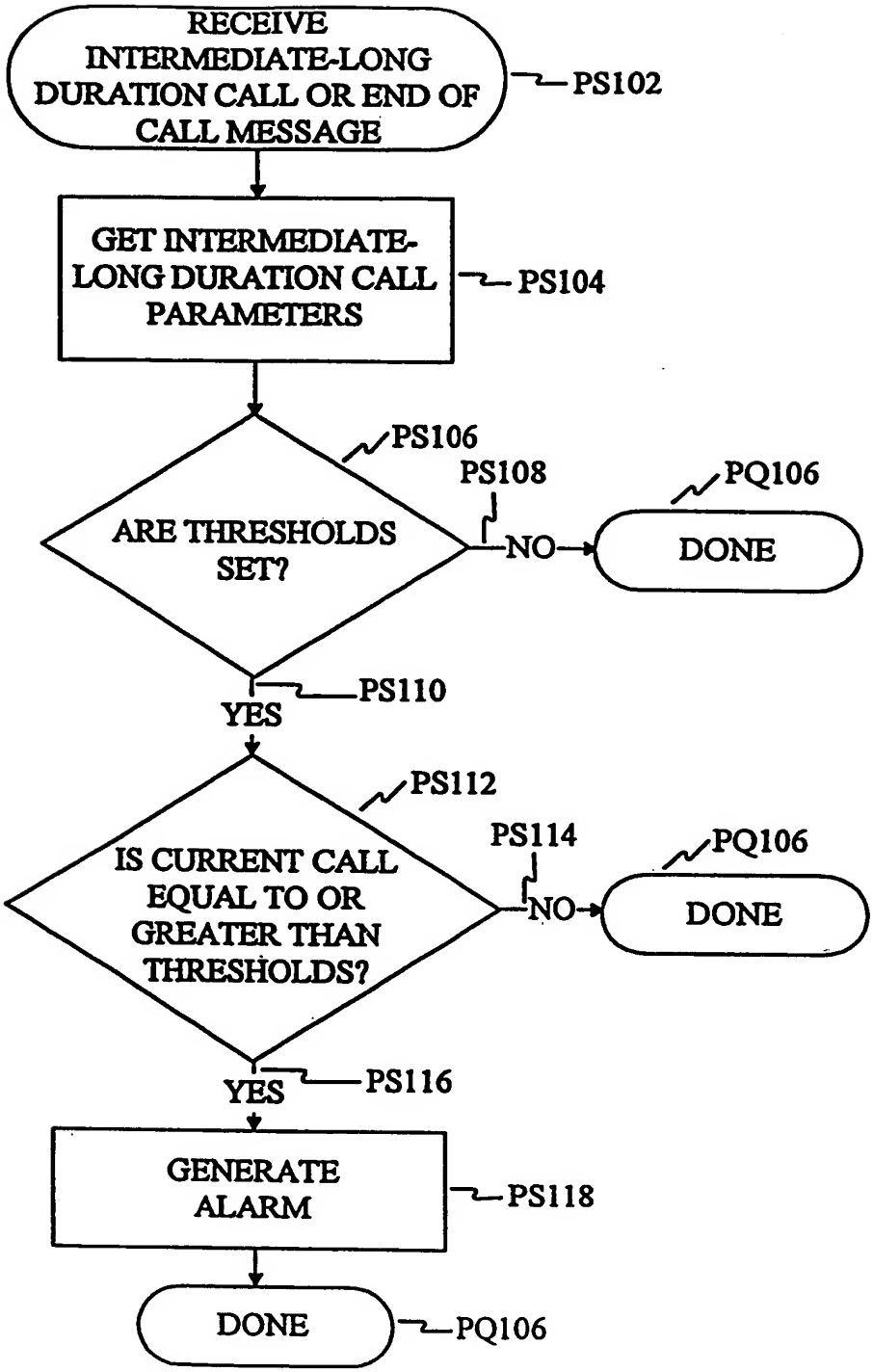

RECEIVE INTERMEDIATE-LONG DURATION CALL OR END OF CALL MESSAGE
PS102
GET INTERMEDIATE-LONG DURATION CALL PARAMETERS
PS104
PS106
ARE THRESHOLDS SET?
PS108
NO
PQ106
DONE
YES
PS110
PS112
IS CURRENT CALL EQUAL TO OR GREATER THAN THRESHOLDS?
PS114
NO
PQ106
DONE
YES
PS116
GENERATE ALARM
PS118
DONE
PQ106

FIG 191

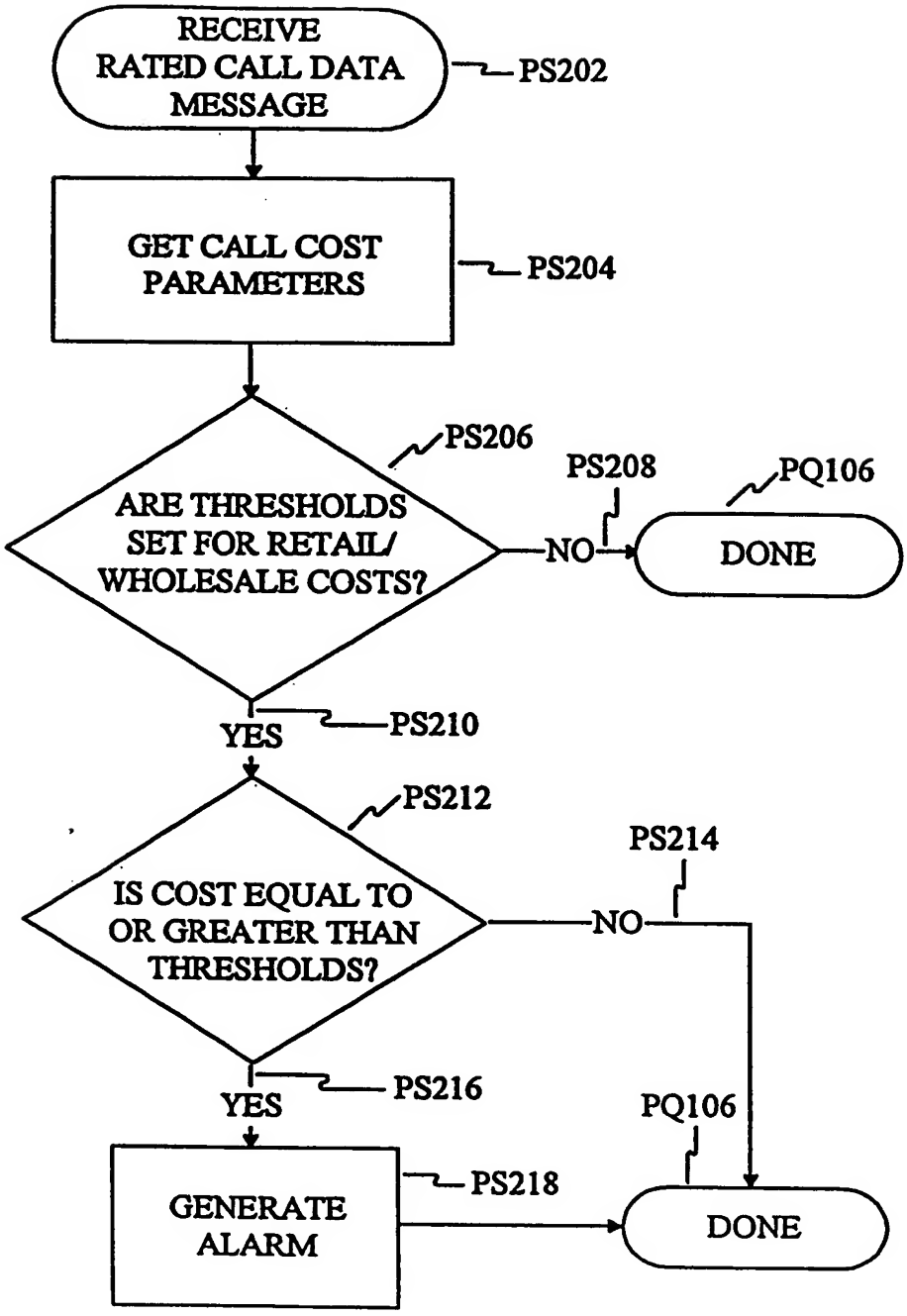

RECEIVE RATED CALL DATA MESSAGE
PS202
GET CALL COST PARAMETERS
PS204
PS206
ARE THRESHOLDS SET FOR RETAIL/ WHOLESALE COSTS?
PS208
NO
PQ106
DONE
YES
PS210
PS212
IS COST EQUAL TO OR GREATER THAN THRESHOLDS?
PS214
NO
YES
PS216
PQ106
GENERATE ALARM
PS218
DONE

FIG 192

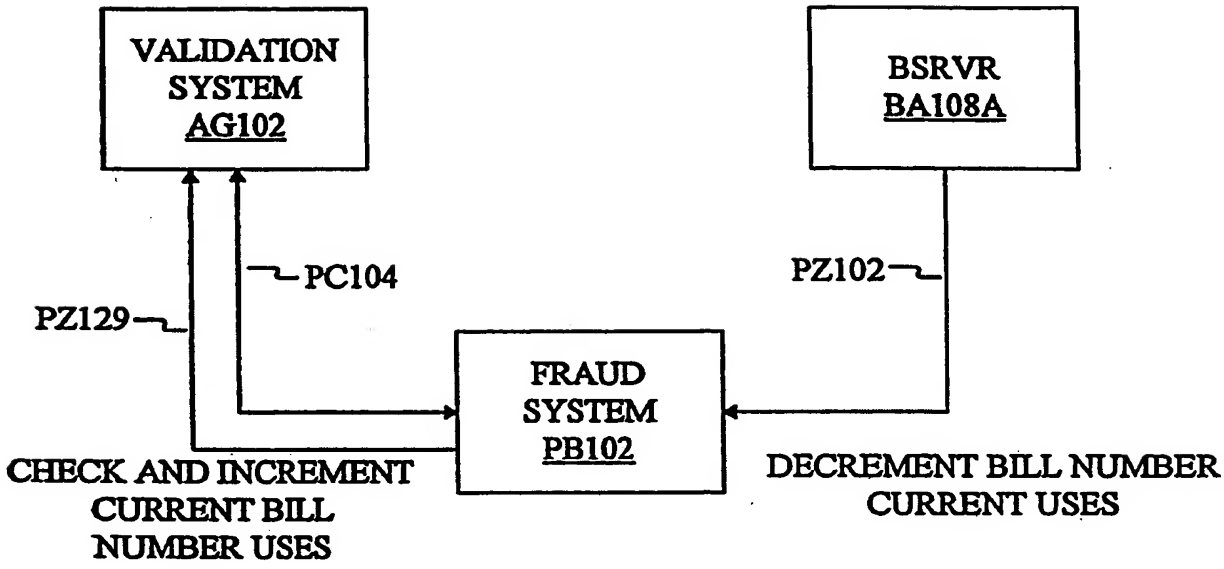

VALIDATION SYSTEM AG102
BSRVR BA108A
PC104
PZ129
PZ102
FRAUD SYSTEM PB102
CHECK AND INCREMENT CURRENT BILL NUMBER USES
DECREMENT BILL NUMBER CURRENT USES

FIG 193

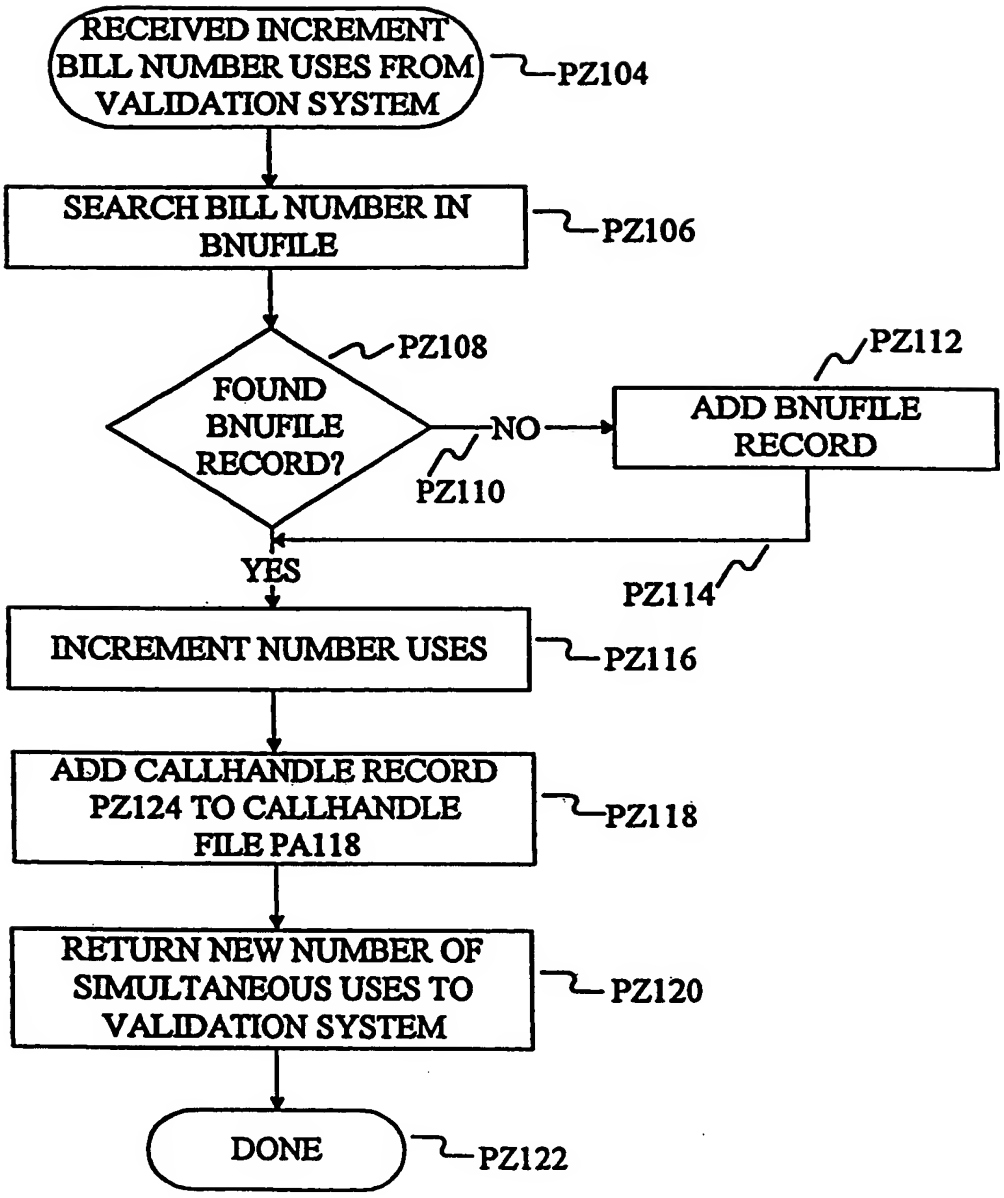

RECEIVED INCREMENT BILL NUMBER USES FROM VALIDATION SYSTEM
PZ104
SEARCH BILL NUMBER IN BNUFILE
PZ106
PZ108
FOUND BNUFILE RECORD?
NO
PZ110
PZ112
ADD BNUFILE RECORD
YES
PZ114
INCREMENT NUMBER USES
PZ116
ADD CALLHANDLE RECORD PZ124 TO CALLHANDLE FILE PA118
PZ118
RETURN NEW NUMBER OF SIMULTANEOUS USES TO VALIDATION SYSTEM
PZ120
DONE
PZ122

FIG 194

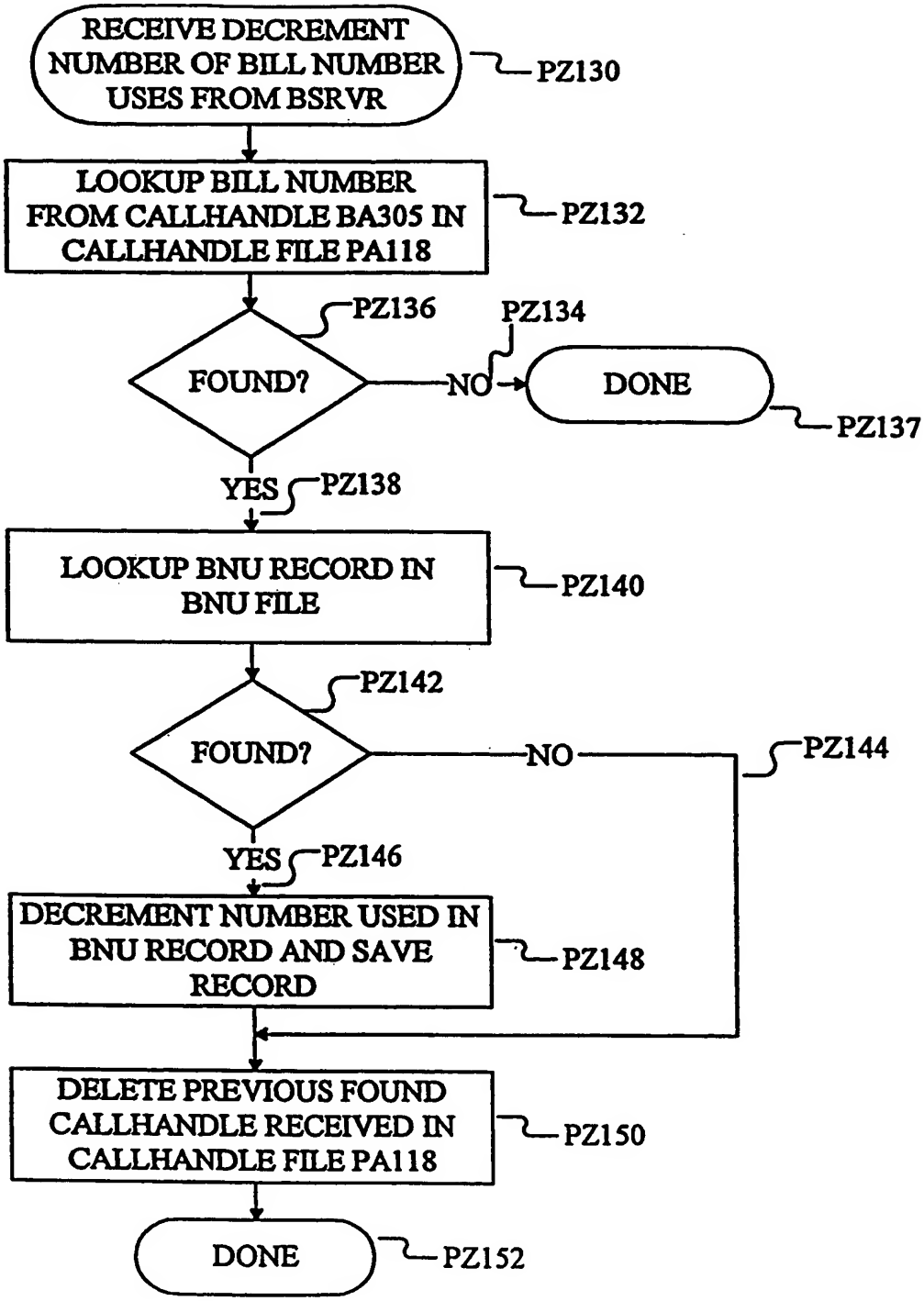

RECEIVE DECREMENT NUMBER OF BILL NUMBER USES FROM BSRVR
PZ130
LOOKUP BILL NUMBER FROM CALLHANDLE BA305 IN CALLHANDLE FILE PA118
PZ132
PZ136
PZ134
FOUND?
NO
DONE
PZ137
YES
PZ138
LOOKUP BNU RECORD IN BNU FILE
PZ140
PZ142
FOUND?
NO
PZ144
YES
PZ146
DECREMENT NUMBER USED IN BNU RECORD AND SAVE RECORD
PZ148
DELETE PREVIOUS FOUND CALLHANDLE RECEIVED IN CALLHANDLE FILE PA118
PZ150
DONE
PZ152

FIG 195

ALARM THRESHOLDS DETAIL INFO

THRESHOLDS KEY 0

TEXT DESCRIPTION:

	ALARMS WILL BE GENERATED IF:	ALARMS DURMS	TONES FRQHZ
0	OR MORE BILLING NUMBER HITS IN 0 MIN	0	0
0	OR MORE BILLING NUMBER HITS IN 0 MIN	0	0
0	OR MORE CALLS/BILLING NUMBER WITH DIFF ANI IN 0 MIN	0	0
0	OR MORE CALLS/BILLING NUMBER WITH DIFF NXX IN 0 MIN	0	0
0	OR MORE CALLS/BILLING NUMBER WITH DIFF NPA IN 0 MIN	0	0
0	OR MORE CURRENT ACTIVE CALLS WITH SAME BILLING NUMBER	0	0
	COMPLETED CALL EXCEEDED 0 MIN	0	0
[ ]	CALL IS INTERNATIONAL	0	0
[ ]	CURRENT ACTIVE CALL EXCEEDS BILLING SERVER WARNING LEVEL	0	0
	COMPLETED CALL EXCEEDED WHOLESALE COST OF DOLLARS	0	0
	COMPLETED CALL EXCEEDED RETAIL COST OF DOLLARS	0	0
	REORIGINATIONS MADE EXCEEDED 0	0	0
[ ]	ORIGINATING ANI IS HOT	0	0
[ ]	CALLED NUMBER IS HOT	0	0

[F1 INSERT] [F2 SEARCH] [F3 DELETE] [ESC CANCEL]

FIG 196

ALARM THRESHOLDS DETAIL INFO

THRESHOLDS KEY 0

TEXT DESCRIPTION:

	ALARMS WILL BE GENERATED IF:			ALARMS DURMS	TONES FRQHZ
0	OR MORE FBNS ON ORIG NUMBER IN	0	MIN	0	0
0	OR MORE FBNS ON ORIG NUMBER IN	0	MIN	0	0
0	OR MORE FBNS ON TERM NUMBER IN	0	MIN	0	0
0	OR MORE FBNS ON TERM NUMBER IN	0	MIN	0	0
[ ]	ORIG NUMBER IS HOT			0	0
[ ]	TERM NUMBER IS HOT			0	0

[F1 INSERT] [F2 SEARCH] [F3 DELETE] [ESC CANCEL]

FIG 196A

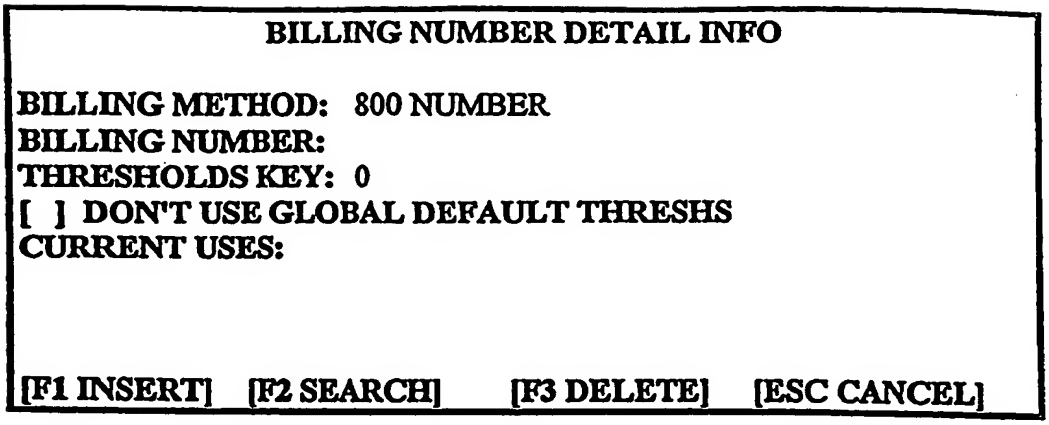

BILLING NUMBER DETAIL INFO
BILLING METHOD: 800 NUMBER
BILLING NUMBER:
THRESHOLDS KEY: 0
[ ] DON'T USE GLOBAL DEFAULT THRESHS
CURRENT USES:
[F1 INSERT] [F2 SEARCH] [F3 DELETE] [ESC CANCEL]

FIG 197

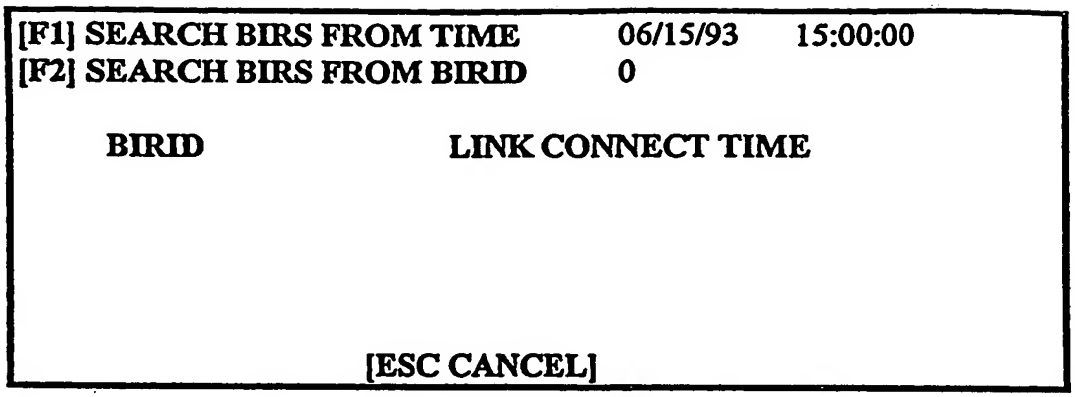

[F1] SEARCH BIRS FROM TIME 06/15/93 15:00:00
[F2] SEARCH BIRS FROM BIRID 0
BIRID
LINK CONNECT TIME
[ESC CANCEL]

FIG 198

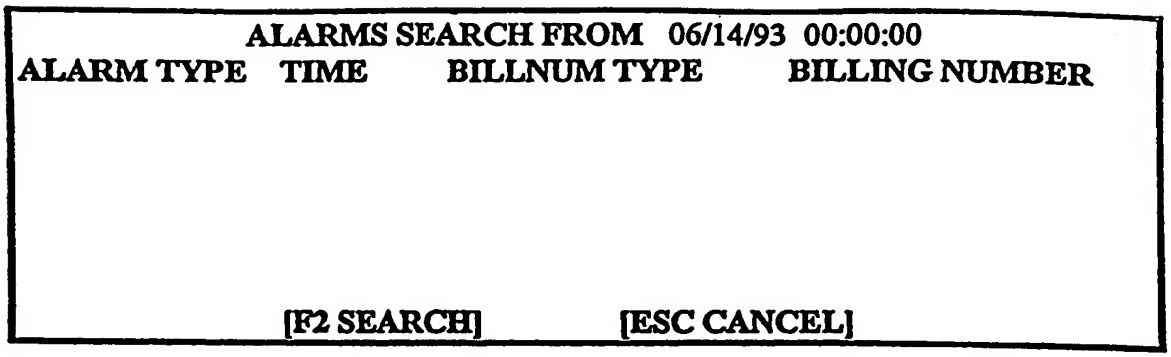

ALARMS SEARCH FROM 06/14/93 00:00:00
ALARM TYPE TIME BILLNUM TYPE BILLING NUMBER
[F2 SEARCH] [ESC CANCEL]

FIG 199

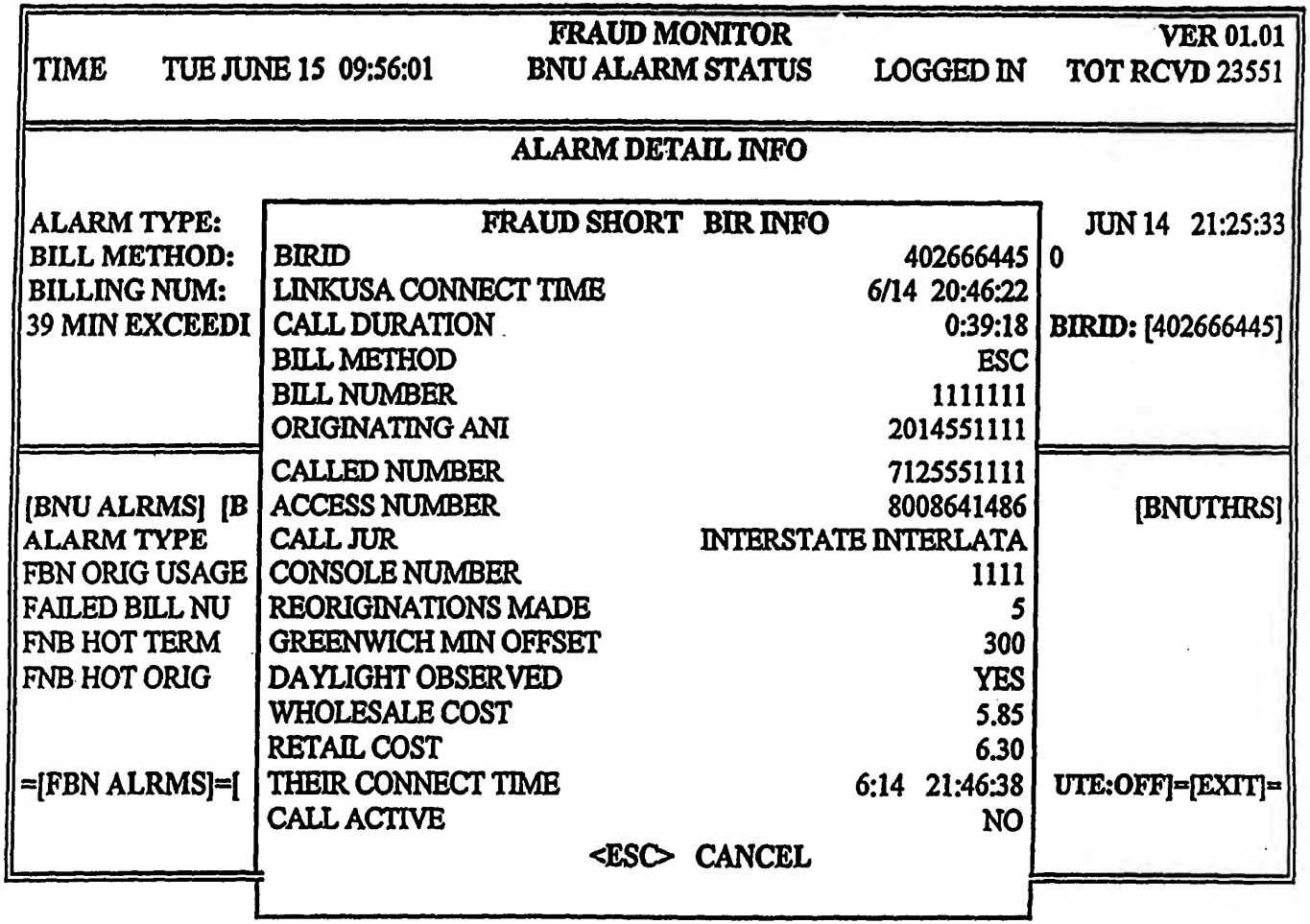

FRAUD MONITOR
VER 01.01
TIME TUE JUNE 15 09:56:01
BNU ALARM STATUS
LOGGED IN
TOT RCVD 23551
ALARM DETAIL INFO
ALARM TYPE:
BILL METHOD:
BILLING NUM:
39 MIN EXCEEDI
[BNU ALRMS] [B
ALARM TYPE
FBN ORIG USAGE
FAILED BILL NU
FNB HOT TERM
FNB HOT ORIG
=[FBN ALRMS]=[
FRAUD SHORT BIR INFO
BIRID 402666445
LINKUSA CONNECT TIME 6/14 20:46:22
CALL DURATION 0:39:18
BILL METHOD ESC
BILL NUMBER 1111111
ORIGINATING ANI 2014551111
CALLED NUMBER 7125551111
ACCESS NUMBER 8008641486
CALL JUR INTERSTATE INTERLATA
CONSOLE NUMBER 1111
REORIGINATIONS MADE 5
GREENWICH MIN OFFSET 300
DAYLIGHT OBSERVED YES
WHOLESALE COST 5.85
RETAIL COST 6.30
THEIR CONNECT TIME 6:14 21:46:38
CALL ACTIVE NO
<ESC> CANCEL
JUN 14 21:25:33
0
BIRID: [402666445]
[BNUTHRS]
UTE:OFF]=[EXIT]=

FIG 200

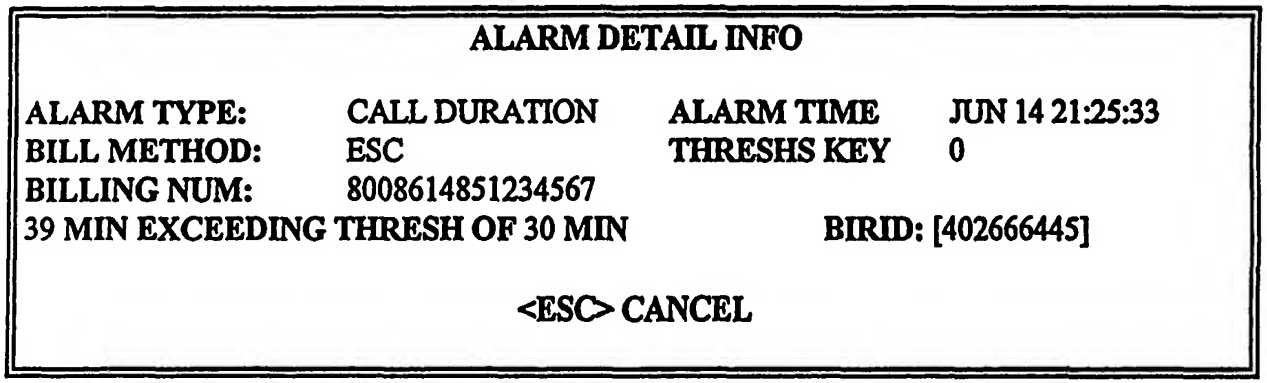

ALARM DETAIL INFO
ALARM TYPE: CALL DURATION
ALARM TIME JUN 14 21:25:33
BILL METHOD: ESC
THRESHS KEY 0
BILLING NUM: 8008614851234567
39 MIN EXCEEDING THRESH OF 30 MIN
BIRID: [402666445]
<ESC> CANCEL

FIG 201

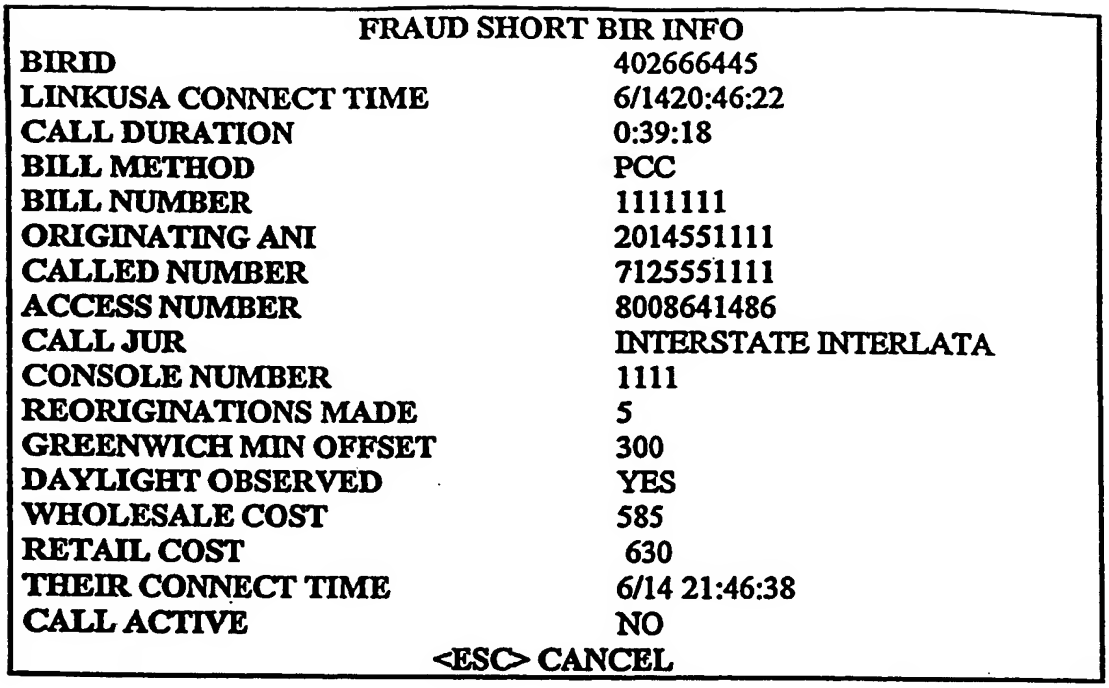

FRAUD SHORT BIR INFO
BIRID 402666445
LINKUSA CONNECT TIME 6/1420:46:22
CALL DURATION 0:39:18
BILL METHOD PCC
BILL NUMBER 1111111
ORIGINATING ANI 2014551111
CALLED NUMBER 7125551111
ACCESS NUMBER 8008641486
CALL JUR INTERSTATE INTERLATA
CONSOLE NUMBER 1111
REORIGINATIONS MADE 5
GREENWICH MIN OFFSET 300
DAYLIGHT OBSERVED YES
WHOLESALE COST 585
RETAIL COST 630
THEIR CONNECT TIME 6/14 21:46:38
CALL ACTIVE NO
<ESC> CANCEL

FIG 202

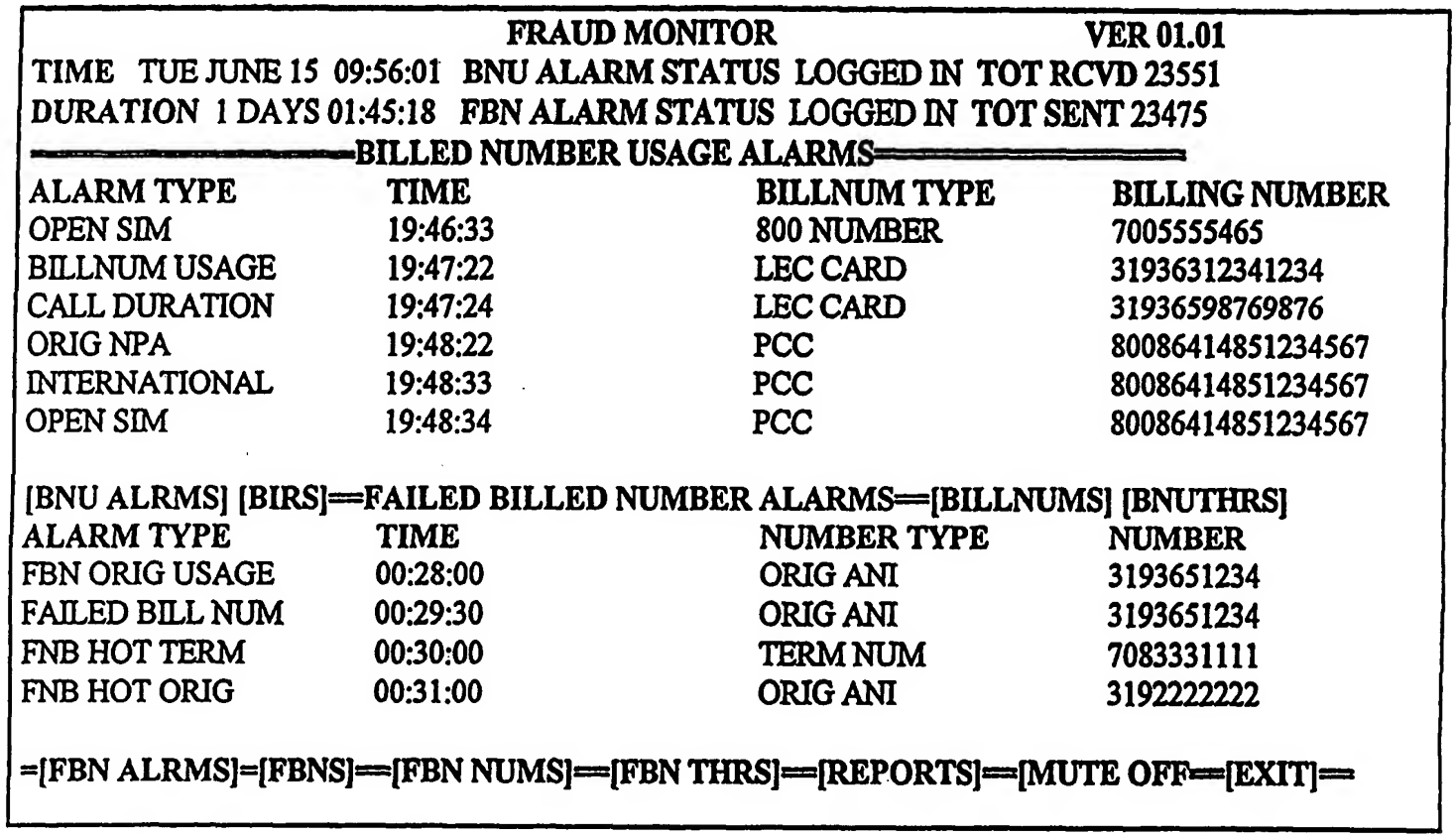

FRAUD MONITOR VER 01.01
TIME TUE JUNE 15 09:56:01 BNU ALARM STATUS LOGGED IN TOT RCVD 23551
DURATION 1 DAYS 01:45:18 FBN ALARM STATUS LOGGED IN TOT SENT 23475
BILLED NUMBER USAGE ALARMS
ALARM TYPE TIME BILLNUM TYPE BILLING NUMBER
OPEN SIM 19:46:33 800 NUMBER 7005555465
BILLNUM USAGE 19:47:22 LEC CARD 31936312341234
CALL DURATION 19:47:24 LEC CARD 31936598769876
ORIG NPA 19:48:22 PCC 80086414851234567
INTERNATIONAL 19:48:33 PCC 80086414851234567
OPEN SIM 19:48:34 PCC 80086414851234567
[BNU ALRMS] [BIRS]=FAILED BILLED NUMBER ALARMS=[BILLNUMS] [BNUTHRS]
ALARM TYPE TIME NUMBER TYPE NUMBER
FBN ORIG USAGE 00:28:00 ORIG ANI 3193651234
FAILED BILL NUM 00:29:30 ORIG ANI 3193651234
FNB HOT TERM 00:30:00 TERM NUM 7083331111
FNB HOT ORIG 00:31:00 ORIG ANI 3192222222
=[FBN ALRMS]=[FBNS]=[FBN NUMS]=[FBN THRS]=[REPORTS]=[MUTE OFF=[EXIT]=

FIG 203

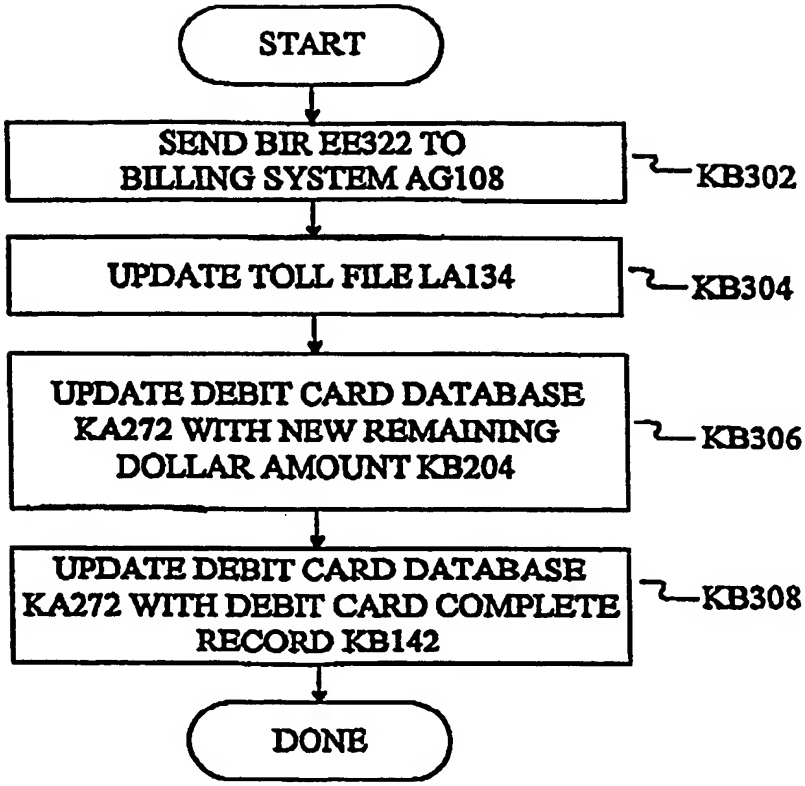

START
SEND BIR EE322 TO BILLING SYSTEM AG108
KB302
UPDATE TOLL FILE LA134
KB304
UPDATE DEBIT CARD DATABASE KA272 WITH NEW REMAINING DOLLAR AMOUNT KB204
KB306
UPDATE DEBIT CARD DATABASE KA272 WITH DEBIT CARD COMPLETE RECORD KB142
KB308
DONE

FIG 204

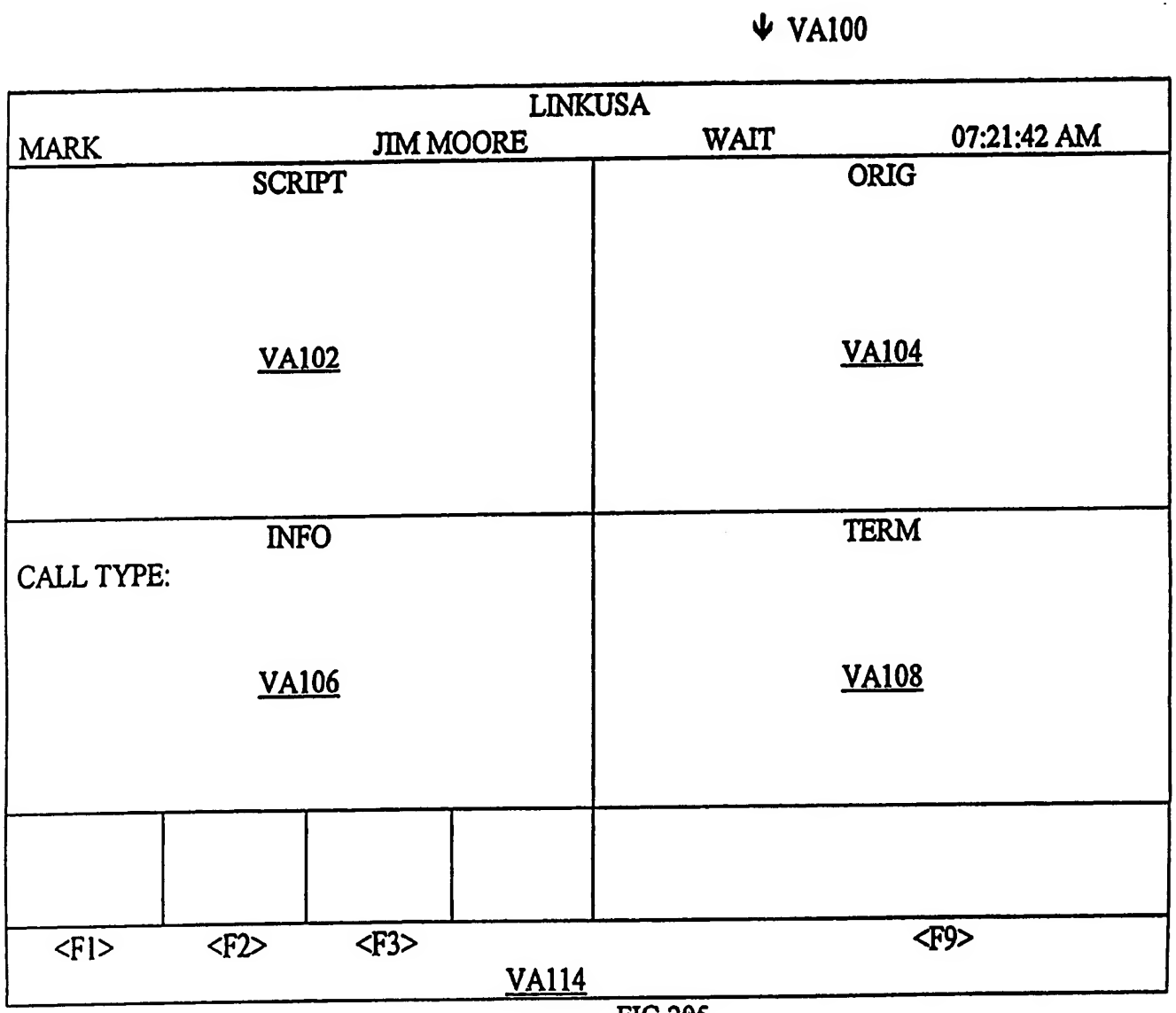

VA100
LINKUSA
MARK
JIM MOORE
WAIT
07:21:42 AM
SCRIPT
VA102
ORIG
VA104
INFO
CALL TYPE:
VA106
TERM
VA108
<F1>
<F2>
<F3>
<F9>
VA114

FIG 205

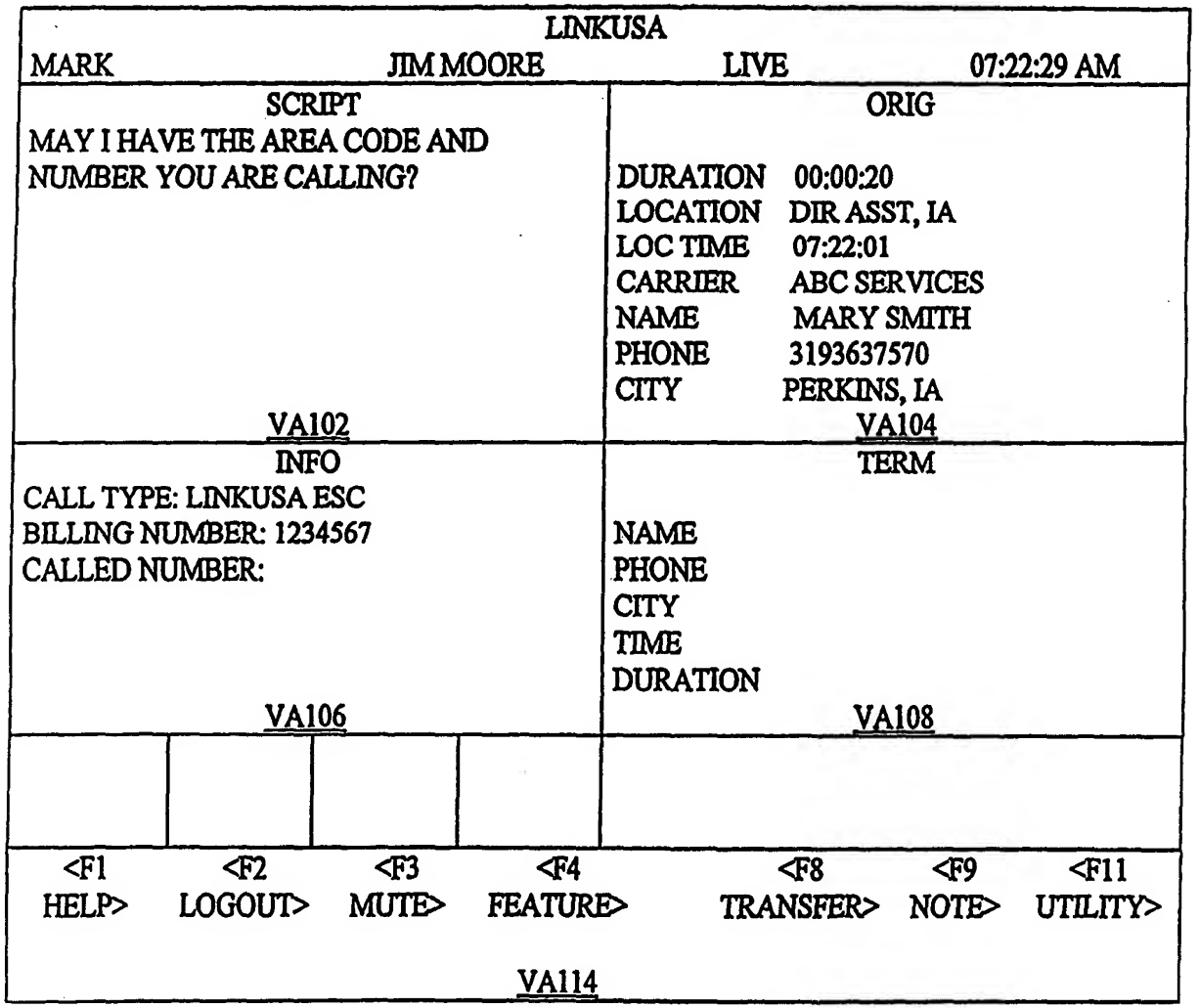

LINKUSA
MARK
JIM MOORE
LIVE
07:22:29 AM
SCRIPT
MAY I HAVE THE AREA CODE AND
NUMBER YOU ARE CALLING?
VA102
ORIG
DURATION 00:00:20
LOCATION DIR ASST, IA
LOC TIME 07:22:01
CARRIER ABC SERVICES
NAME MARY SMITH
PHONE 3193637570
CITY PERKINS, IA
VA104
INFO
CALL TYPE: LINKUSA ESC
BILLING NUMBER: 1234567
CALLED NUMBER:
VA106
TERM
NAME
PHONE
CITY
TIME
DURATION
VA108
<F1 HELP>
<F2 LOGOUT>
<F3 MUTE>
<F4 FEATURE>
<F8 TRANSFER>
<F9 NOTE>
<F11 UTILITY>
VA114

FIG 206

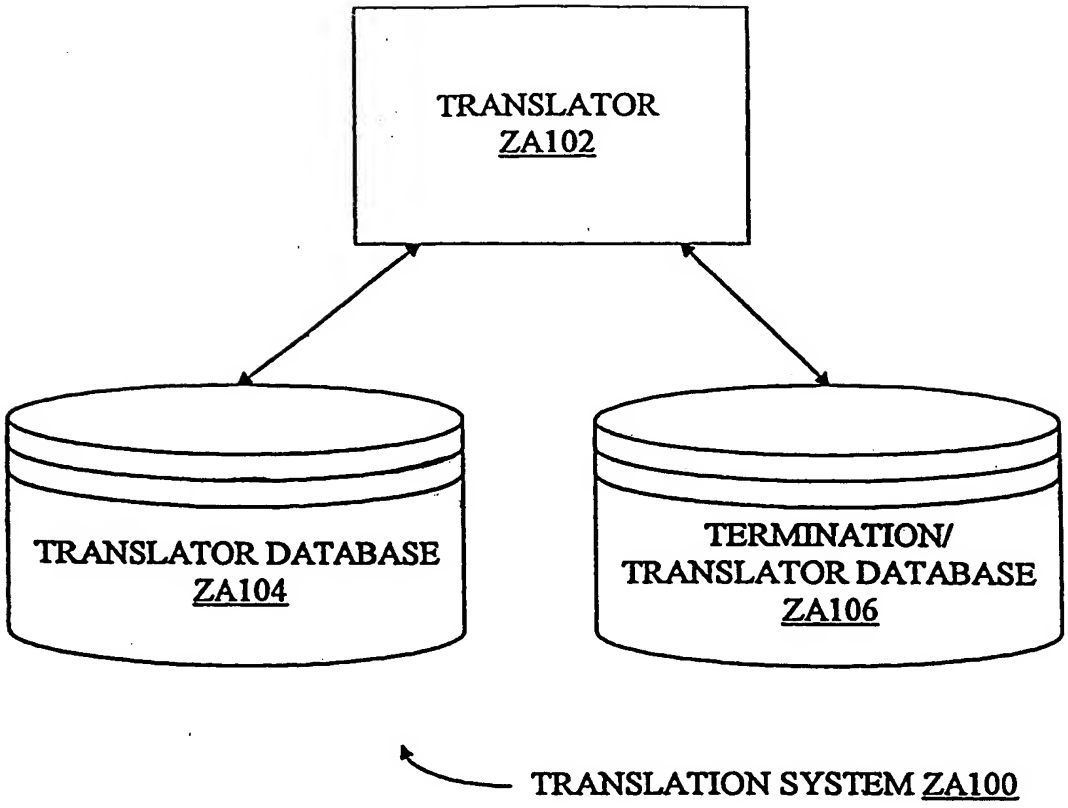

TRANSLATOR
ZA102
TRANSLATOR DATABASE
ZA104
TERMINATION/
TRANSLATOR DATABASE
ZA106
TRANSLATION SYSTEM ZA100

FIG 207